The Commercial Car Journal

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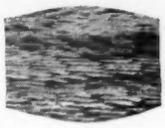
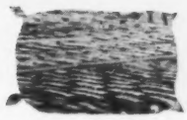
The Motor Truck in Milling Service



Hecker-Jones-Jewell Milling Company is Independent of the Railroads in the Distribution of Its Product in Lower New York State, New Jersey and Long Island



By C. P. SHATTUCK

FREIGHT congestion at railroad terminals in the large cities is a serious problem. Chaotic conditions exist in the distribution of both foreign and domestic freight. The congestion at the railroad terminals and piers in New York City and Jersey City is worse than anywhere else in the country. The war and a shortage of ocean tonnage are factors, but those who have studied the situation say that the conditions in New York are due to the antiquated methods of handling and poor facilities. "Crude and inefficient," is the way they characterize them.

It is estimated that approximately 720,000,000 tons of merchandise is handled every year at the freight terminals in this country and over 600,000,000 tons at the marine terminals, or an average of 4,400,000 tons each working day. The inefficient methods and lack of system represent a loss of more than $80,000,000 alone at the railroad terminals. Four-fifths of the cost of transportation, or about $1,600,000, is paid for terminal work alone. Without doubt this great waste has its bearing on the present high cost of living.

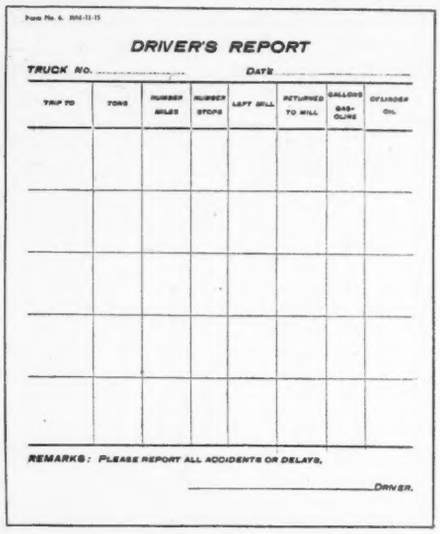
That the railroads are experiencing the heaviest traffic in years is proved by the freight accumulating in warehouses and banked up on terminal tracks. Thousands of cars in Greater New York loaded with food products and manufactured goods from the West cannot be moved for lack of transportation facilities. Similar conditions prevail in New Jersey. Because of these conditions Western motor car manufacturers are shipping to interior points by rail, to New England and upstate New York.

Freight Congestion Expensive to New York

Not only do the present methods occasion delay but greatly increase the cost of handling. In this respect New York suffers in comparison with Philadelphia, for example. Figures compiled by a railroad authority show that it costs 80 cents more in New York to handle a ton of freight, and that the cost of starting a ton of freight and handling it from the terminal at Jersey City to the consignee's store is about 14 times as much as the expense in transporting the goods from Philadelphia to New York. In other words the haulage and terminal expenses are over 20 per cent. more than the cost of transportation by rail and over 1000 miles.

Freight in New York City is handled by the crudest kind of labor. There is a lack of mechanical carriers, movable platforms or other scientific means that would not only greatly reduce the cost per ton of handling to the railroads and steamship companies but would bring about economy and efficiency. The same methods in vogue 25 years ago obtain, and there appears to be a lack of co-ordination of the railroads and teaming interests. The fact that there appears to be no schedule as to receiving and delivering freight is costing the shipper and railroads thousands of dollars. When it is considered that there are over 40,000 vehicles engaged in hauling merchandise to and from the terminals and piers on the west side alone and that most of these are at the piers

and terminals at approximately the same time, the congestion is explained. During these rush hours it is not uncommon for a vehicle to wait hours before it can reach the shipping or receiving platforms. Several superintendents of transportation and with concerns maintaining a large fleet of trucks and horse drawn equipment



DRIVER'S REPORT

TRUCK NO. ..... DATE .....

TRIP TO	TONS	NUMBER MILES	NUMBER STOPS	LEFT MILL	RETURNED TO MILL	GALLONS GASOLINE	CYLINDER OIL

REMARKS: PLEASE REPORT ALL ACCIDENTS OR DELAYS.

..... DRIVER.

Driver's Report Which Keeps Track of Tonnage, Mileage, Stops, Etc.

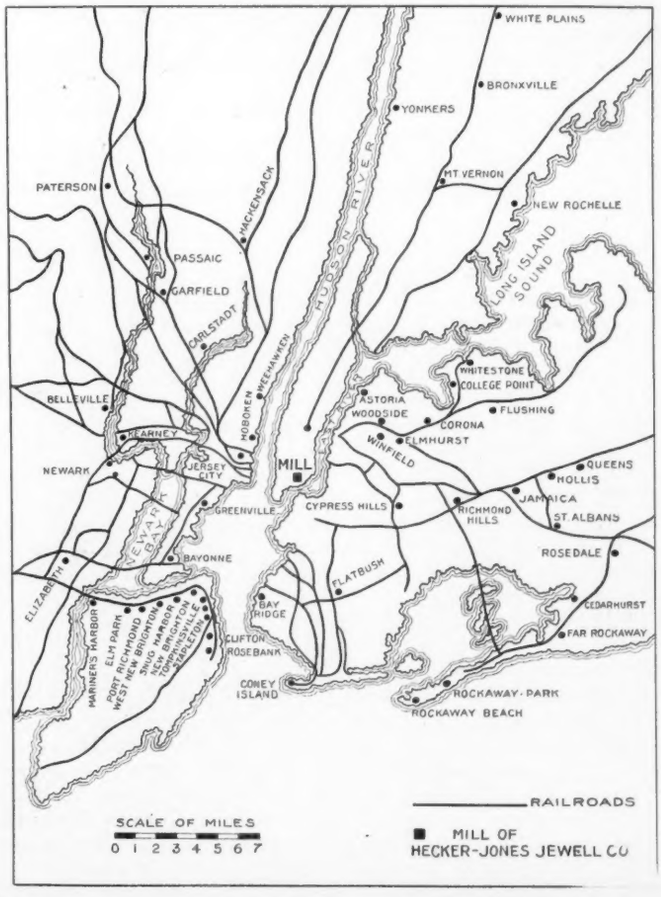
have informed the writer that it is not at all infrequent for their men to have to wait until their goods were dug out of a pile of mixed shipments. It is these conditions that have seriously retarded the adoption of the motor truck in New York City, and many merchants who would replace horses with trucks will not consider the investment. Where the vehicle must stand idle from 3 to 4 hours each working day the actual loss is considerably less with the horse.

Until these conditions are remedied, and a schedule adopted that will permit of a day and night shift at the terminals, which would allow the motor truck to come into its own, business concerns in New York must suffer delays and losses. Where the haul permits and on routes not more than the length of a maximum day's truck run the commercial car can save from 15 to 20 hours as compared with the time taken by rail. This contention is proved by the experience of the Hecker-Jones-Jewell Milling Co., of New York, whose flour products and cereals are known all over the world. While this concern is not in competition with the railroads it has developed a transportation system with motor trucks for supplying its trade, which is strictly wholesale, within a radius of from 20 to 50 miles. It has eliminated the troubles experienced with freight congestion and attendant delays in supplying its customers in the above named territory, and this trade cannot be inconvenienced in the delivery of the vitally necessary food products by railroad strikes as the wheat is brought to the mill by boats.

In the distribution of its products to the trade, which includes stores and large bakeries, the trucks of the Hecker-Jones-Jewell Co. cover a considerable territory, as is indicated by the accompanying map. It would be thought that with the large number of railroads available and the distance intervening between the mill and points of distribution that shipment by rail would be preferable and more economical, particularly when it is considered that the trucks are empty and have no earning capacity on the return trip. That the company considers it has solved the haulage problem for the territory covered and that the truck is more rapid and economical, is indicated by the experience extending over a period of 4 years and that during the past 16 months three 3½-ton, one 2-ton and one 7½-ton Hurlburts have been added to the fleet. The first truck placed in service was a 5-ton Peerless in the fall of 1912, and a year later four Alcos were added.

Although the territory is routed the trucks do not maintain any well defined schedule of trips; that is, the same truck is not always employed to cover the same trip. There are practically 10 standard routes, these taking the trucks to New Jersey with Paterson and vicinity the maximum point. In New York the machines cover the boroughs of Brooklyn, Queens, the Bronx and Richmond, and often travel 90 miles in a day although the average is generally between 50 and 90, depending upon the orders received and the material to be moved. The trip is determined largely by the orders received by the shipping department and the load to be carried, and the assignment may be such that a truck returning from a trip to New Jersey may be sent with another load to points in Queens, or with an emergency order to points in the Bronx. This method has its advantages in that each driver and helper becomes thoroughly familiar with each route and the trade, and in case of illness or an accident the delivery system is not disarranged. Time is also saved with emergency orders.

The longest route, that is, the trip on which the greatest number of miles are traversed, is to the upper and western part of White Plains, Yonkers and Mt. Vernon. Distribution is made in quantity, and also in mixed loads, to the trade in and around these places, and the truck averages 62 miles on the round trip. Another trip takes a truck to Cypress Hills, Richmond Hills, Jamaica, Hollis, Queens, St. Albans, Rosedale, Cedarhurst, Far Rockaway and Rockaway Park, a round trip of 49 miles. About every day or every other day in the summer a trip is made with 40 barrels of flour to Rockaway Beach. The Brooklyn trip averages 51 miles and includes Brooklyn, Winfield, Woodside, Elmhurst, Corona, Flushing, College Point, Whitestone, Beachhurst and Forest Hills. The trucks cross the bay by ferry to Staten Island, delivering a mixed load on the south side to Tomkinsville, Stapleton, Clifton and Rosebank, and on the north side to New Brighton, West New Brighton, Snug Harbor, Port Richmond, Elm Park and Mariner's Harbor, a total of 30 miles. This trip is made twice a week. Another route includes Bronxville and to the east and west, where a mixed load is carried and

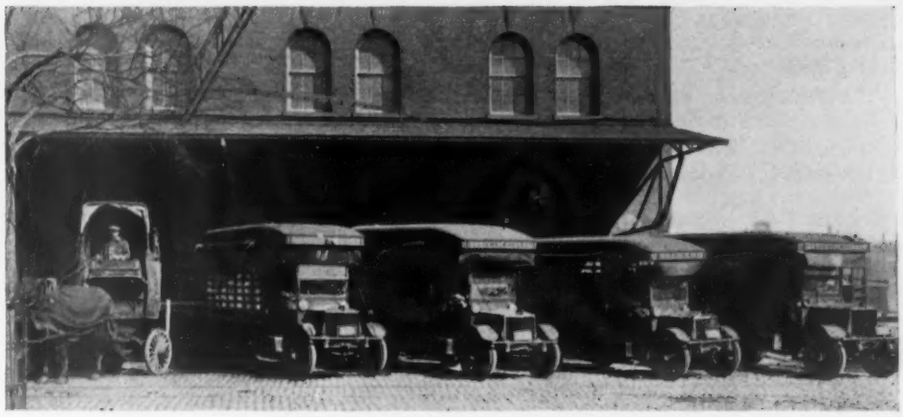


Map of Territory Covered by Hecker-Jones-Jewell Milling Company Trucks

the average is 34 miles. The Brooklyn trip proper takes in sections of that city, also Bay Ridge, Coney Island, Flatbush and Bath Beach, an average of 30 miles.

The maximum number of miles made by a trip in New Jersey is the route including Kearney, Belleville, Hackensack, Paterson and Carlstadt, which frequently averages 51 miles when the products are taken from New York. When conditions permit, the load is taken at the warehouse at Newark. Hoboken, Union Hill, Jersey City, Greenville and Bayonne are among the places covered on another trip, as is Weehawken, Hoboken, Jersey City and Cliffside. The average for these routes is about 26 miles.

The trucks are loaded at the platforms of the mill, bags of flour being shot through chutes to the vehicles while barrels and cartons are loaded from the platform. The trucks are loaded to an over capacity, the 3½-ton Hurlburts often carrying 4 tons or 40 barrels of flour to a load. Inasmuch as a barrel of flour runs from 200 to 217 lb. the load frequently amounts to 4 1-3 tons. The Hurlburt trucks are giving excellent service according to F. B. Wilshire, superintendent of transportation, under whose direction the delivery system has been perfected. He believes in employing none but the most capable drivers and as an example of the work performed by a 3½-ton Hurlburt with a driver showed the writer a driver's report card, the figures of which indicated that Philip Bonner hauled 120 bbl. of flour and covered 70 miles in the delivery to distant points in New Jersey, these including Paterson, Passaic, Wallington, Garfield, Elizabeth and Newark. The service obtained with the trucks is all the more noteworthy when it is considered that the driver and helper unload the goods and carry them into the store or bakery. Very often the men are obliged to make room for the flour, and frequently carry it up or down stairs, all of which means a loss of time.



Eliminating the Railroad in Flour Haulage

Part of the fleet being loaded at the mill platform. Notice the space required by the horse-drawn equipment, and its limited capacity

Hauls One Hundred and Twenty Barrels of Flour a Day

One of the pioneer three and a half ton Hurlburts, having a record of three trips of forty barrels each to New Jersey, and which covered seventy miles. The service obtained with this car led to the addition of seven more machines.

The first Hurlburt truck was placed in service in September, 1914, and a month later two 3½-ton trucks of the same make were added. These cars gave such good service that in October, 1915, a repeat order for three more was placed with the Hurlburt Motor Truck Co., and in November of the same year a 2-ton was purchased. The Hecker-Jones-Jewell Milling Co. also bought a 7½-ton Hurlburt, which has been in operation about 13 months, and which hauls two carloads of flour, or 8 tons.

Mr. Wiltshire stated that the trucks were standing up well despite the loads carried, and that the original Hurlburt lost but 8 days in the first year of service and that there were no repairs charged up against it as adjustments, etc., were taken care of in the service plan of the truck company. Also the milling company maintains its own garage and mechanics, and has a very complete machine shop in the mill where any needed work on the trucks can be performed. There are no regular periods assigned for an overhaul of the machines,

Hauls Flour in Carload Lots

This seven-ton Hurlburt frequently transports eight tons of flour, or two carloads. The illustration shows the truck being loaded with bags of flour which weigh ninety-eight pounds each

the work being done from time to time and as required. All of the vehicles are thoroughly inspected.

The examination of an applicant for a driver's position is rigidly conducted. The average driver would hardly measure up to the standard maintained. The new man is sent over a route with an experienced driver and his method of handling the truck carefully noted. Drivers make out a daily report on a card and upon starting on a trip enter the number of the truck, quantity of fuel and oil, load in tons, destination and time of departure. Upon the return the card must bear the record of stops made, mileage and time of arrival. These cards are signed and the data is entered on a special form sheet in book form. This enables the superintendent to note the performance of each machine, as well as to ascertain the efficiency of each crew. A trouble or service car, a light vehicle, is maintained.

The company maintains over 80 horses, and these are utilized in short hauls and to railroad terminals and piers where under the existing conditions the horse-drawn equipment is more conomical. While no figures as to the cost of operating the trucks were available the fact that the company has steadily increased its investment in commercial cars indicates their practicability in this particular industry. They have made possible the elimination of the railroad in the territory served, and the customer obtains better service in that the cost of loading at the terminal and transportation of the consignee are eliminated. In other words, the door-to-door service is performed in the one operation. Inasmuch as a customer is enabled to replenish his supply on the same day the goods are ordered this spells service and must be reckoned as a business asset to the industrial plant. The delivery of 40 barrels of flour within eight hours of the receipt of the order would not be possible under the existing freight conditions and the value of the service is obvious. The experience of the Hecker-Jones-Jewell Milling Co. proves conclusively that motor trucks can be efficiently operated in the inter-city haulage of products of industrial plants.

S. K. F. AND HESS-BRIGHT TO BE UNDER ONE MANAGEMENT

The S. K. F. Administrative Co., 11 Wall St., New York City, will manage the affairs of both the S. K. F. Ball Bearing Co. and the Hess Bright Mfg. Co., Philadelphia. The board of this new concern consists of Frank A. Vanderlip, president of the National City Bank, Thatcher Brown, of Brown Bros., F. B. Kirkbride, S. Wingquist, Axel Carlander, and Marcus Wallenberg, a well-known banker of Sweden, and B. G. Pryzt, president of the S. K. F. Bearing Co. Budd D. Gray, of the Hess-Bright Mfg. Co., has resigned as president of the Philadelphia company and will become technical advisor of the New York corporation. B. G. Pryzt has been elected to succeed Mr. Gray as president. The S. K. F. Administrative Co. is expanding the manufacturing facilities of both the Philadelphia and Hartford plants.

Motor Trucks in War Time

Suggested Ways for Mobilizing All Sections for Governmental Assistance

By FRANK FARRINGTON

ABUNDANT transportation operating freely is a prime essential in war time. The necessity for means with which to move troops and munitions along with other army supplies and move them without delays, means the frequent transfer to the Government of rolling stock that would otherwise be used by the railroads in the transportation of other commodities.

Thus the motor truck must during war become extremely valuable to business concerns and to communities to insure the moving of supplies they need and cannot get by rail, to say nothing of the value of trucks for use by the Government in handling its own transportation problems.

One of the greater and newer fields the war will open for the sale of motor trucks will be for community use. Cities dependent upon outside sources for food supplies should have at their command trucks that may be used by the municipal authorities to hurry the distribution of foodstuffs to sections unable to secure sufficient supply through the ordinary channels. Towns of all sizes are going to feel a greater need than ever for keeping their highways open and in good condition. The use of motor trucks in repair work of this sort is almost imperative where delays may be dangerous.

In all sections where Government motor trains or where troops are to be moved by highway, it is the duty of the towns to keep their highways in the best possible condition. This cannot be efficiently and rapidly done except with the use of trucks.

Local patriotism is going to make every community anxious to do its utmost to further the plans of the Government and to conserve its own resources. This will mean extending help to all the people who are trying to work for the general good. Communities having one or a fleet of motor trucks at their command will be able to help their citizens in many ways. The spirit of patriotic generosity that will prevail throughout the country will make the authorities of any town or city willing to purchase motor trucks if they can see where they can be used to economic advantage. The agents for such trucks should study into local conditions and outline plans for the use of trucks by the authorities. When an agent can present a definite plan for the advantageous use of one or more trucks by municipal authorities in his community, he has done more than develop a possible prospective customer for trucks, he has done something of service to his country. His own profit on the deal is of secondary importance. In fact, he may want to arrange with the manufacturer to be allowed to deliver the trucks without himself making any profit.

Incidentally the automobile agent should do everything he can to encourage the organization of the local motorists for auxiliary assistance. If there is no automobile club in his community, he should organize one for the war. If there is one, he should encourage it to take up the matter of offering its services to the Government.

If there is a military organization in the dealer's community he may be able to interest some wealthy citizen in providing it with motor equipment in the way of trucks for supplies and ambulance use. Where there is such an organization that is not a part of the state or national forces, this motor equipment must necessarily be furnished by private funds unless the state takes over the organization.

A chamber of commerce or a commercial club may very well prove to be a possible purchaser of a motor truck for public or military uses. The dealer should get information from the government authorities as to what sort of an outfit is acceptable for army use and he then will be in a position to present a detailed statement of the kind of car and the necessary accessories to go with it. In other words, he will be informed on the subject and will not have to guess, and hence will get the order. when some other agent who does not know what it is all about falls down when he is asked to make an estimate on the completely equipped truck.

At such times the individual dealer should not think too much about how much money he can make out of this class of business. If he is going to stay home and attend to business it may be his part in helping on the cause to sacrifice profits and make it possible to supply better equipment to the fellows who go out to fight. We must be patriots first and automobile agents afterward.

MANY NEW MEMBERS FOR S. A. E.

At a recent meeting of the S. A. E. Council held in the offices of the Society in the Muncie Bldg., Washington, D. C., 227 applicants for membership were passed upon. This is a result of the special membership campaign which was conducted by the Society during April. Of the members entering the Society, 70 were classed as full members, 110 as associates, 21 as juniors and 26 as students.

AUTOCAR ESTABLISHES PACIFIC COAST BRANCHES

Owing to the rapidly increasing use of Autocar delivery vehicles on the Pacific coast, the Autocar Co., of Ardmore, Pa., has opened direct factory branches in Los Angeles, San Diego and San Francisco. These branches will conduct business under the name of the Auto Car Sales & Service Co., of California. M. S. Bulkley, who has been for years the California representative of the Autocar, now has charge of the Pacific coast.

Military Truck Specifications

Fortuitous Result of the Coöperation of the S.A.E. and Government Officials

THE automobile engineers have cooperated even beyond expectations in the formulation and putting into effect of military truck specifications for the War Department. For over a year the Society of Automotive Engineers has through its various committees been working with the Quartermaster General's office and the War Department Motor Transport Board in the preparation of specifications which have been issued recently in booklet form in connection with the request for bids from manufacturers to furnish 70,000 military trucks.

A two-day meeting was finished on the night of June 3, in the rooms of the Advisory Commission of the Council of National Defence, in Washington, representatives of engine, transmission and truck manufacturers being present. As a result of this meeting the very important and highly valuable decision has been arrived at that the engines and transmissions to be used in many of the military trucks will be interchangeable, without regard to the particular make of transmission or engine. This will not only facilitate the putting of the necessary number of trucks into service but will decrease greatly problems connected with the replacement of parts and the making of emergency repairs in the field.

The details of this fundamentally important plan are being followed up, and weekly meetings will be held in Detroit and Washington in consummation of it. The manufacturing considerations, which engine, transmission, axle, radiator and frame manufacturers encounter, will be reconciled to a degree not heretofore thought possible.

Among those attending the meeting were: George W. Dunham, president of the Society of Automotive Engineers; John G. Utz, chairman of the Standards Committee; K. W. Zimmerscheid, past chairman of the Standards Committee and chairman of the Automotive Committee of the Advisory Commission of the Council of National Defence; Captain W. M. Britton, motor transport engineer of the Quartermaster General's office; Coker F. Clarkson, general manager, Society of Automotive Engineers; A. W. Copeland, chairman of the Transmission Division of the S. A. E.; W. A. Frederick, G. W. Yeoman, Continental Motor Mfg. Co.; H. L. Horning, Waukesha Motor Co.; R. J. Broege, The Buda Co.; A. F. Milbrath, Wisconsin Motor Mfg. Co.; O. J. Strayer, J. M. Cook, Hercules Motor Mfg. Co.; E. P. Reber, Cotter Transmission Co.; E. O. Spillman, Herschell-Spillman Co.; E. W. Miller, Fellows Gear Shaper Co.; A. C. Bryan, Dursten Gear Co.; L. C. Fuller, Fuller and Sons; H. W. Chapin, A. E. Parsons, Brown Lipe Gear Co.; A. A. Gloetzner, Covert Gear Co.; L. P. Kalb, Kelly-Springfield Motor Truck Co.; C. B. Rose, Velie Automobile Co.; R. W. Austin, Gramm Bernstein Motor Truck Co.; E. E. Wemp, Denby Motor Truck Co.; W. A. Olen, R. M. Newbold, Four-Wheel Drive Auto Co.; J. E. Gramlich, Sanford Motor Truck Co.; G. V. Doramus, Service Motor Truck Co.; K. K. Hoagg of the Washington S. A. E. office.

Never before in the history of the automotive industry have various commercial interests so effectively and completely given up all individual considerations for the purpose of evolving a product with nothing in view but the common good. In so doing the industries involved have contributed their resources to the successful prosecution of the war. The value of the work is greatly increased by the fact that the trucks evolved are not only of great military value but will be particularly satisfactory for commercial use, principally for owners of large fleets in cities or those having widely distributed fleets. The military truck has been developed with the primary consideration of reliability and certainty of performance under adverse conditions and as two-and-a-half and five ton trucks, Class A and Class B specifications, will give a commercial performance which will insure minimum maintenance and operation costs. Thus the Society of Automotive Engineers and the Quartermaster General's office have happily produced not only a military truck of the most advanced type, but a commercial vehicle for freight haulage of unusual value.

This magnificent piece of work therefore insures that when the American army finally appears on the field of battle in France it will be equipped with motor trucks which for quality of design and reliability of performance will be superior to the truck equipment of any other army that has ever taken the field.

WANTS FEDERAL CONTROL OF MILITARY UNITS

Military Engineering Committee, of New York, representing in its membership the national engineering societies of the United States, is in favor of Federal control of engineering units. It has urged voters to recommend this resolution to Congress:

Whereas in any large army to be created for the war, engineer troops will be needed in large numbers, and

Whereas, they should be officered by skilled engineers only, and

Whereas, the composition and training of such troops differ so much from the composition and training of non-technical troops that they should be organized under one central authority rather than under many scattered authorities,

Now, therefore, be it

Resolved, That the members of the Senate and House of Representatives be requested to insist that all new units of engineer troops be organized and maintained by the War Department and not by the individual States.

THE GASOLINE SHORTAGE IN GREAT BRITAIN

Owing to the increasing stringency in the supply of motor spirit further drastic measures have been taken in Great Britain. The renewal of licenses to cars used for purely private purposes has been refused, while private cars for business purposes are now limited to 10 gal. per month, and cars registered as hacking carriages for hiring out are restricted as follows: 30 gal. a car each month if only one car is owned, 25 gal. if two cars only, 20 gal. if more than two cars.

Doubtless the same influences have led to the new stock issue of the National Steam Car Co., of London, which offers for subscription $500,000 worth of stock in ordinary shares of $5 each at par. This is the company already running quite an extensive service of steam omnibuses in London, and the object of this issue is to provide funds not only to extend the business, but to change the equipment of the present vehicles so as to burn coke instead of the kerosene now in use. For some time past coke-fired lorries on this principle have been running in this country.

Since May 12 no motor spirit (which includes kerosene and other substitutes for gasoline), has been allowed for any car let on hire, unless it is used for hospital or medical work, for naval, military or munitions work, or is authorized by the Board of Trade for any special purposes.

The firms supplying gasoline have pooled their supplies and energies, and the resulting pool board will now only market war kerosene Nos. 1 and 2, and war motor spirit Nos. 2 and 3. It is thought that this arrangement will greatly aid in distributing stocks and economizing fuel and labor. The formation of the Petrol Pool, as it is called, is already having a beneficial effect, in that the pool, being composed of men who know their business, is doing much to influence the action of the Petrol Control Committee, which has hitherto shown consummate incompetence.

DESERT GARAGES NEED SPRING STOCK

An experienced observer who recently made the trip overland by truck from Texas through the southwestern desert country to California found that there was only one class of trouble that was practically universal in trucks and touring cars operating in this district. This was spring breakage.

There is always a certain amount of overloading and the combination of overloading and extreme severity of road shocks with glowering sun and sand that helps to dry up lubricants quickly, results in more spring breakage than in any other section of the country. It is particularly unfortunate that garages in this territory do not seem to be completely stocked with supplies for making quick spring repairs on all the types of machines commonly employing the highways of this district.

DIFFICULTIES OF MOTOR TRANSPORT AT THE FRONT

By L. M. MEYRICK-JONES, London

It is difficult for those not on the spot, or at any rate, for those unacquainted with the roughest kind of experience, to realize the difficulties that have to be faced by motor transport on the war fronts. One correspondent from the front in France has written me to say that the motor transport problem is getting ever more interesting as the vehicles grow older and more war-worn, for loads have increased, and the roads are indescribable. It is an actual fact that not only trucks but caterpillars sometimes fall bodily into shell holes, so that rather extraordinary breakdowns are met with at times.

The cold weather of the winter, too, tried certain parts severely. Radiators, even with hood covers on, have frozen up while the car was in motion. A correspondent writes: "A few weeks ago I went to Rouen, and having no chains, tried to get a grip on the frozen road by keeping one side in the snow. That was all right until we fell into a hole, and it took two solid hours getting out again. Of course the generator froze up solid during this time, and after it had thawed on the exhaust, we put some warm water in the container, then before the drip had time to get the gas going she had frozen up solid again. On returning from Rouen we had more trouble, as the chains obtained from the base would not fit, and so after struggling at a hill 20 miles from Rouen for hours, changing all wheels around to get plain rubber on the rear wheels we had to go back and get some proper chains."

MILITARY TRUCKS GIVEN ALPHABETICAL CLASSIFICATION

The request made by the Standards Committee of the S. A. E., in reference to naming the military trucks as class A for the 1½-ton truck, and Class B for the 3-ton truck, has been granted by the War Department. The object in asking for this change was that the trucks specified have to carry more than the nominal load and are in every way heavier and larger than 1½ and 3-ton trucks, and are much heavier than if built for regular commercial service. This definition is much appreciated by truck manufacturers.

TO STANDARDIZE TRUCK ACCESSORIES

With the idea of standardizing near accessories that will be needed for military trucks, several members of the Truck Standards Committee of the S. A. E. at Washington recently with a dozen or more representatives of truck factories and representatives of the Quartermasters' Department. The work taken up included such parts as front and rear bumpers, towing hooks, seating arrangements, large gasoline tanks, magneto straps and couplings, radiator guards and other parts, such as dust collectors for the carburetors and generator mountings.

S.A.E STANDARDIZATION WORK

On May 3 an important meeting of the entire Standards Committee of the Society of Automotive Engineers was held in Cleveland, O. From the Aeronautic Division a report was received and accepted with some exceptions which were referred back to the committee. The items considered in this report were control, hard wire ends, flexible cable ends, galvanized non-flexible cable ends, turnbuckles, marking of fuel and oil pipes, elimination of gage numbers, thimbles, engine supports, use of English measuring system, spark plugs, approval of existing S. A. E. specification for aeronautical work, tachometer drive shaft and safety belts.

The Ball and Roller Bearings Division submitted a report on metric and inch sizes of thrust bearings, which was accepted. A progress report from the Chain Division referred to the pitch and width of silent chains. The Electrical Equipment Division submitted a report on generator flanges, starting motor flanges and ignition distributor mounting, which was accepted. The Engine Division reported on dimensions of poppet valves, which report was accepted, and the Iron and Steel Division made a progress report on the temper and finish of sheet steel. A progress report was also heard from the Lighting Division giving the headlight nomenclature.

The Marine Standards Division reported on spark plugs and the approval of existing S. A. E. standards for marine work, which was accepted. The Springs Division submitted its report on the finish of springs, length of spring seats and spacing of spring clips and the Starting Battery Division a report on starting battery terminal posts. The Tire and Rim Division report received referred to types of pneumatic tire rims, inflation pressures and loads on pneumatic tires, thickness of pneumatic tire rims and carrying capacity of solid tires. The Truck Standards Division's military truck specifications were ratified and the Miscellaneous and Transmission Divisions gave verbal reports on progress.

The conclusion of the program was a report from the Research Division by Prof. D. L. Gallup on the apparatus used by the committee to test cars for acceleration, fuel economy, etc. A proposed standard form for a complete car performance test was submitted and rules for the conduct of fuel economy runs and acceleration runs. Particularly of interest was the apparatus exhibited used for recording acceleration. A description of the apparatus, as given in the report, is as follows:

Attached to the right front wheel is a gear which meshes with another, directly driving an electrical make-and-break contact. The ratio of the diameter of these two gears is such that the contact is made and broken five times each revolution of the road wheel. This making and breaking of an electrical circuit causes a spark to jump through a strip of paper fed by a motor attached to the main device and which is carried in the car. Upon the same strip of paper seconds are recorded by a special clock carried in the car. Current for these operations is furnished by a storage battery, also carried in the car, but separate from its standard equipment.

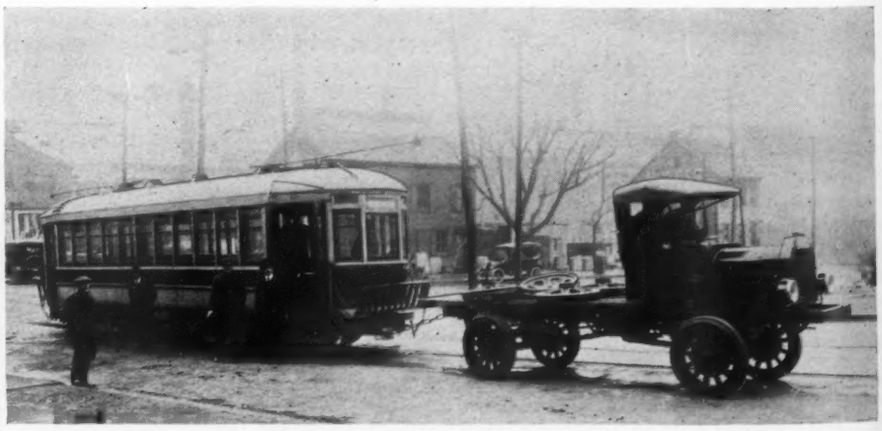
By comparison between the holes caused by the jumping of the spark through the paper with the seconds recorded, calculations may be made, giving directly the average velocity of the car during any second.

In addition to the foregoing there is attached to the accelerator pedal an electrical contact, controlling a pen, which records on the strip of paper the exact instant when the accelerator is depressed.

The meeting was presided over by Chairman J. G. Utz and there were about 60 members in attendance.

The meeting held particular interest at this time on account of the active work being done by the society through all of its departments in co-operating with the Government in connection with the equipment of the army with automotive apparatus and training the necessary drivers and mechanicians.

H. W. JOHNS-MANVILLE Co. has opened new and larger showrooms and offices on the ground floor of the Westinghouse Bldg., Ninth and Pennsylvania Ave., Pittsburgh.



Recent Demonstration of the Pulling Power of the Duplex Four-Wheel Drive Truck, in Harrisburg, Pa.

A three and a half ton truck made by the Duplex Truck Company, Lansing, Mich., towed a trolley car, weighing twenty-five tons, carrying ten passengers, up State Street hill. The street was wet with rain and the tracks were slippery, but no chains were used on the truck, which easily pulled the street car up the hill without slipping.

S. A. E. SUMMER MEETING AT WASHINGTON

Definite plans concerning the summer meeting of the Society of Automotive Engineers, to be held June 25 and 26 at the Bureau of Standards, Washington, were settled at the May meeting of the Council of the Society, which was held in the new S. A. E. Washington offices in the Munsey Building.

An informal dinner will be held in the banquet hall of the New Willard Hotel, Tuesday evening, June 26. Secretary of War, Newton Baker, has accepted an invitation to be present and address the engineers. The other speakers have not been decided upon as yet. It is expected that this dinner will be the greatest get-together of the Government officials and S. A. E. members in the history of the Society. Over thirty guests, representing the Army and Navy from Washington, will be present, and in addition the Council of National Defense and other organizations, co-operating with the Government at the present time, will be invited.

The professional session on Tuesday, June 26, will be one of particular interest. The majority of the papers to be presented have already been decided upon and all will be of a practical type. Wing Commander, I. W. Seddon, R. N. A. S., who is a member of the British Commission in this country, and who is demonstrating some of the British types of war airplanes here, has agreed to present a paper dealing with the practical aspects of airplane manufacture, and to include much other information greatly needed by manufacturers and engineers. Commander Seddon has had much practical experience on the Somme front.

Major Rees, also of the British Commission, an experienced British aviator throughout the entire Somme campaign, who accompanied the Commission to give practical information on what airplanes of different types are actually called upon to do, has practically agreed to answer various questions on this interesting subject.

The matter of motor trucks in the European war is being handled by W. Owen Thomas, consulting engineer of Detroit. For over two years Mr. Thomas was head of military motor transport work for the Canadian Government under Major-General Sam Hughes, former Minister of Militia for Canada. Mr. Thomas was on the French and British front for fourteen months.

H. L. Horning, of the Waukesha Motor Co., is preparing a practical paper on farm tractors. Last year 35,000 tractors were manufactured. It was hoped this year to manufacture 70,000, but shortage of material and labor has cut this down. Mr. Horning has been co-operating with the Department of Agriculture, demonstrating how the tractors in present use are averaging 48 days per year work, which is only one-third of their capacity. Plans are under way to show how farm tractors can be of great assistance to the Government in solving the present food problem.

The motor boat activities of the S. A. E. will be represented by Henry R. Sutphen, vice president of the Elco Co., who will give an illustrated talk on standardization methods and production plans used in building the 500 submarine chasers, which this country supplied to the British Government. The illustrations will be in the form of three reels of moving picture films, covering the complete scope of the work. The films will be accompanied by explanations by Mr. Sutphen.

The professional session will be held at the Bureau of Standards as will the Monday meeting of the Standards Committee. The daily sessions are scheduled to begin at 10 o'clock and continue until 4.30 o'clock.

Through the courtesy of the Bureau of Standards it has been arranged to make an inspection of the various departments of the Bureau on the afternoon of Monday, June 25, beginning at 3 o'clock. It is more than possible that special demonstrations of testing materials and of other work of the Bureau will be arranged for at that time.

The headquarters of the Society will be at the New Willard Hotel.

It is expected that over 800 members of the Society will be present at the meeting and the dinner.

TIRE MAKERS TO FORM ASSOCIATION

A division of the Rubber Association of America is being organized by tire makers. This move was approved at a recent meeting of most of the principal tire makers. The new division will be similar in organization and purpose to the other existing divisions of the Association. It will take up the problems of the tire makers with a view to solving them in a manner acceptable to all. At the meeting it was also decided to adopt a standard contract clause covering fluctuations in tire prices, which provides that if a maker finds it possible to reduce the price to the dealer, he will give the dealer the benefit of the reduction, and if the maker increases the price, the dealer is to have the choice of accepting the balance of unfilled contracts at the advanced rates or of cancelling the balance of the contract.

GREAT DEMAND FOR TRUCKS IN MEXICO

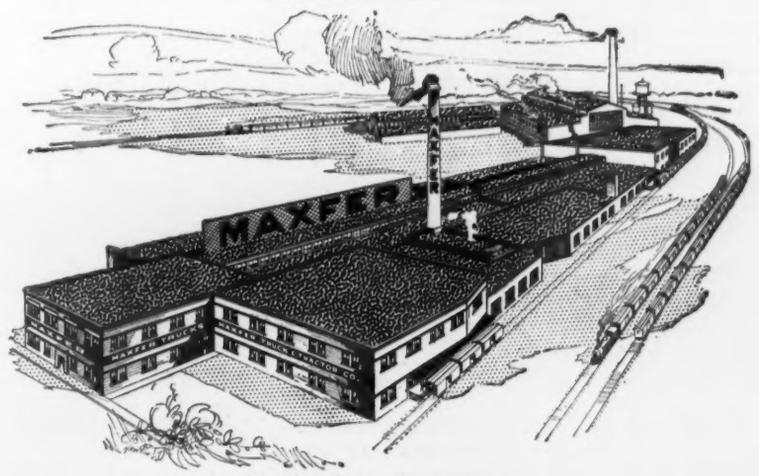
At the present time there is a great demand for trucks coming from Mexico, and many carloads have been shipped there through El Paso, Eagle Pass and Laredo. Recently a large mining company placed an order for eight Jordans, which were immediately shipped. All of the larger foreign owned mining companies are planning to utilize trucks instead of the slow-moving burro wherever possible. In the oil producing territory around Tampico many American companies are installing motor trucks for the transportation of supplies and lighter machinery to the different camps.

HIGHER TAXI FARES IN LONDON

There is every possibility of taxi fares being raised in London, and with that in view there has been a conference between representatives of the Home Office and the owners and drivers. At present London fares amount to about 16 cents a mile, or if the speed drops below 10 miles an hour, 16 cents per 10 minutes.

TWO STATES MOBILIZE TRACTORS FOR FARM USE

Kansas and Missouri are mobilizing tractors to increase the food supply. Kansas has appointed a Council of Defense, and both states have provided committees to see that machinery, especially tractors, is put to a maximum use. The Kansas City Tractor Club has pledged its support to the two state governments in the supreme effort for food production. It has heard from many bankers of the two states that they are ready to agree to finance the purchase of tractors by responsible parties. It has also adopted resolutions suggesting that the supply of steel for tractors and implements be conserved and that the sale of tractors abroad that might be needed at home be guarded against.



Maxfer Buys New Plant

The Maxfer Truck and Tractor Company has purchased a new plant for the manufacture of its trucks, at Harvey, Ill., a suburb of Chicago. The new plant is ten times as large as the old one, and the production after the first of May will be three hundred Maxfers per day. Mr. Henry, general manager, states that the materials on hand will enable the company to increase this output again in about sixty days. The Maxfer Company, in nine months, has grown to an organization of twelve hundred dealers, and a representative in almost every city in the United States and Canada, and in many foreign countries.

DEVELOPING MODERATE-PRICED HEAVY-DUTY TRUCK

Something new and interesting in the heavy duty motor truck line is promised by Frederick William Unger of Philadelphia, the man who accomplished the financing of the Commercial Car Unit Co., which acquired the business of the Hudford Co. Mr. Unger has interested an important group of capitalists in a manufacturing company which is preparing to build a truck of new design and he believes that it will have a remarkable success because it will open to a large field of users the possibility of heavy duty trucks at a moderate first cost and moderate repair and maintenance expense.

Production plans are being perfected by the H. J. Graham Engineering Corp., Abbott Bldg., Philadelphia, which has had entire charge of the engineering and development work for about a year, although the incorporation took place only a few months ago. It is reported that valuable patent privileges have been acquired as a result of nearly eight years of development work by a number of engineers and inventors. H. J. Graham, formerly chief engineer of James Boyd and Bros. Co., manufacturers of fire trucks and apparatus, is in immediate charge of the technical work and is assisted by A. J. Suttill, an English engineer of wide experience.

The capitalization will be at least one million dollars and possibly larger, at any rate sufficient to finance a company with resources ample to provide for the demand anticipated from dealers and agents when the proposition is made known. The announcement of the new truck and the company's plan for distribution will be made in the near future.

CLARK EQUIPMENT CO., Buchanan, Mich., when the new plant is completed and new machinery installed, will be able to turn out approximately 100 wheels per day, and not 100,000 as stated in our last issue.

QUARTERMASTER'S DEPARTMENT CALLS FOR BIDS

The Quartermaster's Department of the United States Government, at Chicago, has recently asked for bids on 74,400 automobiles, mostly trucks, said bids to be opened June 8th. About one-half of the machines will be trucks, of Class A specifications, recently developed by the Standards Committee of the S. A. E. and half of the Class B construction. In addition, bids are asked for 200 ½-ton trucks, 200 ¾-ton trucks, 1000 5-passenger touring cars, 3000 runabouts, 10,000 motorcycles and 20 repair shops.

JOBBERS' CONVENTION AT HOT SPRINGS CALLED OFF

At a recent meeting of the N. A. A. A. J., the majority vote decided not to hold the meeting scheduled for Hot Springs, Va., June 4th to 6th, it being thought that the present time was not favorable to such a meeting.

FORD TRACTOR IN ITS ENTIRETY ADOPTED BY ENGLAND

England has adopted the Ford tractor in its entirely and the Minister of Munitions is asking all manufacturers concerned to co-operate loyally in making the standardized products. C. E. Sorensen is issuing blue prints to the different makers with instructions to begin work on tractor construction immediately.

WISCONSIN DUPLEX AUTO CO., Clintonville, Wis., has been incorporated with a capitalization of $500,000 to manufacture a four-wheel drive light delivery car as well as pleasure cars. The officers are: Wm. A. Besserdich, president and chief engineer; A. S. Larson, vice-president; B. A. Mosling, secretary and manager, and J. B. Mosling, treasurer. The Board of Directors is composed of these officers and J. H. Frank.

United Truck Replacing Horse-Drawn Vehicles in Grand Rapids Garbage Department

During two months of operation this three and a half ton truck, specially designed by the United Motors Company, Grand Rapids, Mich., has done the work in connection with the garbage department at Grand Rapids that was previously done by twelve horses. The truck, equipped with two heavy tanks, has a capacity of seven tons wet garbage. With the tanks removed, it will carry eleven barrels of night soil. The arrangement is interchangeable. It has been possible, since its installation, to sell off twelve horses, and dispense with the services of ten men. A driver and an assistant operate the truck. Three trips are made to one with a horse-drawn vehicle, and the capacity of each load is nearly four times as much. The new city commission is considering a plan for disposing of all horses and horse-drawn equipment and the installation of two more trucks to care for all the work of the department.

HESS-BRIGHT FURNISHING LARGE QUANTITIES OF BALL BEARINGS FOR WAR PURPOSES

"There are two outstanding factors in modern warfare that the conflict in Europe has brought out," Howard Coffin, chairman of the board of the Advisory Commission of the Council of National Defense, said recently. "One is the submarine, the other is the aeroplane. I might add a third, the heavy, high powered motor truck for transportation purposes. We now believe the United States has started on the right road toward working out her destiny in the air and taking the place to which her capacity entitles her and which the world expects of her."

"We have been in constant touch for weeks with aircraft manufacturers on the problem of quantity production of machines," and the Government authorities are signing contracts for as many machines as our appropriation permits.

The Hess-Bright Mfg. Co., well known as the makers of ball bearings under the Conrad patents, are authority for the statement, now made to the public, following Mr. Coffin's frank admission of conditions, that they are now and have for some time been booking orders in large quantities for ball bearings, specified in Government contracts with large manufacturers of motor trucks and aeroplanes. Many orders for thrust bearings of the larger sizes specified for use in the building of submarine-chasers have also been booked.

Continued use of the modern battle plane has proven the necessity for climbing power and speed. The superiority of one pilot over another is easily overcome by the less able of the two if he has the more modern and therefore fastest climbing and speediest mount. In fact, the types and needs of various planes have changed so rapidly from day to day that American manufacturers now have the advantage and initial production can be initiated at a time when the acme of power and design has about been obtained.

Other contracts booked by the Hess-Bright concern, in addition to the annular bearings for battle and training planes, call for their Monarch bearing, built under the Conrad patents,—recently adjudicated—in quantities for mounting in the hubs, transmissions and steering knuckles of high-powered trucks.

LOCOMOBILE CHANGES IN SALES AND SERVICE ORGANIZATION

Clinton B. Amorousm, assistant sales manager of the Locomobile Co. of America, Bridgeport, Conn., has resigned to accept a position with the Parrish Mfg. Co., Detroit, as assistant factory manager. P. W. Hine, formerly manager of the Bridgeport branch, has become assistant sales manager. M. A. Pollock has been appointed manager of the Bridgeport branch, succeeding Mr. Hine. Associated with Mr. Pollock is F. C. Bancroft, as superintendent of the Service Department. He has been for the past two years connected with the Service Department of the company in New York City.

THE COMMERCIAL CAR JOURNAL

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THE MOTOR TRUCK IN HIGHWAY BUILDING

MOTOR trucks are more often thought of as road destroyers than as road builders. Evidence that they can perform in the latter role is given in a page of illustrations reprinted elsewhere in this issue from a journal devoted to the cause of better roads: THE ROAD MAKER.

Particular attention is called to the tribute to the motor truck in the first paragraph of the article accompanying the illustrations. It is particularly gratifying because of the quarter from which it comes. Commercial cars owe so much to good roads that it is pleasant to be told by those who are working for road improvement that more and better highway construction has been made possible by the motor truck. It certainly is gratifying to feel that there is after all real reciprocity and that the debt of appreciation is not all on one side.

One of the best refutations of these baleful arguments and well deserved rebukes of the alarmists appeared in the Philadelphia North American and is quoted elsewhere in this issue. We cannot too strongly urge that everyone who has misgivings as to our financial future should read this and take heart.

DO YOUR TRUCK SHOPPING EARLY

IT will be the Government's part to interfere as little as possible with the commercial activities of the country while it is conducting the war. Correspondingly, it is the patriotic duty of individuals and companies to get the supplies needed in the conduct of their business without obstructing the filling of orders for the Government.

The United States has asked for bids on 70,000 motor trucks which is said to equal four times the annual output of the high grade truck manufacturers of the United States. The companies who are contemplating adding to their commercial car equipment will do well to put their orders forward as far as possible or else prepare themselves to postpone them so as to give the Government work the right of way once it is begun.

One of the large truck companies has announced that customers who will require trucks within the next eighteen months should take immediate steps to anticipate any shortage in truck deliveries, for during the latter part of 1917 and the year 1918 it is anticipated that it will be extremely difficult for anybody but the Government to buy high grade trucks.

SELLING COMMERCIAL CARS

SALESMEN and salesmanship are subjects deserving of much and frequent discussion in any trade paper. No better authorities on either of these subjects are to be found than those whose business it is to direct salesmen. It is for that reason that we addressed a letter a short time ago to the sales managers of the principal automobile and commercial car factories, asking them for a comment on some phase of the broad subject of Selling.

That we stirred up a question of the keenest interest to a great many was quickly and forcefully demonstrated by the responses which were so numerous that we were unable to get them all in the June issue of the *Automobile Trade Journal* and more will be continued in the July number.

Of these comments those that dealt specifically with truck selling will appear also in THE COMMERCIAL CAR JOURNAL beginning in this and continuing through subsequent issues, a few being used at a time, and it is hoped that the opinions and suggestions offered may stimulate others to take part in the discussion to the end that there may be some valuable information brought out of assistance to the whole fraternity.

Truck selling and pleasure car selling are two different things altogether calling for different attributes in the men who engage in the two fields. A success in the selling of pleasure cars may miserably fail as a commercial car salesman and vice versa. If anything, more specialization is re-

quired in the commercial car field and, as several of the letters we have had from truck sales managers indicate, a successful truck salesman must be an expert on transportation problems. Conversational powers are of little account in this line. Facts and figures are what the prospective users of commercial cars are interested in and before they will buy they must be shown that there is more than a sentimental advantage in motor delivery.

Metal and Rubber Markets

Steel Mills Working to Capacity

The demand for steel in all its forms has come to such a state that price ceases to be anything more than a minor factor. Orders that at one time would have been gladly welcomed are now rejected. Production is seriously being hampered for want of labor, fuel and cars. Steel for Government shipbuilding requirements is holding back the steel needed for railroad, structural and manufacturing work. The building trades have been out of the steel market for some time, while the automobile manufacturers and other like consumers are cutting down their specifications to the lowest possible requirements. Quotations on June 8th were:

Steel Products Prices

Bessemer billets, per ton, mill	85 00 a 90 00
Open hearth, per ton, mill	85 00 a 90 00
Sheet bars, per ton	85 00 a 90 00
Forging billets, per ton, mill	105 00 a110 00

Sheets

The following prices are for 100-bundle lots and over f.o.b. mill; smaller lots are $2 per ton higher:

Blue Annealed Sheets—	Cents per lb.
Nos. 3 to 8	6 00 a 6 50
Nos. 9 to 12	6 25 a 7 00
Nos. 13 to 16	6 75 a 7 50

No. 17 and lighter gauges are based on $6.50 a $7.50 per 100 lbs., for No. 28 Bessemer Black sheets.

Box Annealed Sheets, Cold Rolled—	
Nos. 17 to 21	6 80 a 7 30
Nos. 22 and 24	6 65 a 7 35
Nos. 25 and 26	6 90 a 7 60
No. 27	6 95 a 7 45
No. 28	7 00 a 7 50
No. 29	7 65 a 7 85
No. 30	7 15 a 7 65
Galvanized Sheets of Black Sheet Gauge—	
Nos. 10 and 11	7 00 a 7 50
Nos. 12 to 14	7 10 a 7 60
Nos. 15 and 16	7 35 a 7 85
Nos. 17 to 21	7 40 a 7 90
Nos. 22 and 24	7 55 a 8 05
Nos. 25 and 26	7 70 a 8 20
No. 27	7 75 a 8 25
No. 28	8 00 a 8 50
No. 29	8 15 a 8 65
No. 30	8 30 a 8 50

Above prices are for Bessemer stock. For open hearth stock $2 per ton advance is charged.

Iron and Steel at Pittsburgh

Bessemer iron, Valley furnace	45 00 a 48 00
Bessemer steel, f.o.b. Pittsburg	75 00 a ....
Skelp, grooved steel	3 50 a 3 75
Sheared steel skelp	3 75 a 4 00
Ferromanganese (80 per cent.)	425 00 a450 00
Steel, melting scrap	27 00 a ....
Steel bars	4 00 a 4 25
Manganese ore, per unit	1 00 a ....
Black sheets, 28-gauge	5 25 a 6 00
Galvanized sheets, 28-gauge	8 00 a 9 00

Prices of Finished Products

There is a fairly active demand for finished copper and brass goods at the following quotations f.o.b. mills (unless otherwise noted):

Sheet zinc	$19 00a ....
Sheet aluminum, 1917 contract	42 00a ....
do, outside market contracts	65 00a75 00
do, outside market prompt shipment	75 00a80 00
Aluminum wire, outside market prompt shipment	70 00a75 00
Copper wire	37 00a38 00
Sheet copper, hot rolled	40 00a ....
Sheet copper, cold rolled	41 00a ....
Copper in rolls	40 00a ....
High brass sheet	33 25a35 25
High brass wire and light rods	33 25a35 25
High brass heavy rods	33 25a33 75
Low brass sheet, wire and rods	38 75a ....
Bronze sheet, wire and rods	43 25a46 00
Brazed brass tubing	46 75a49 75
Brazed bronze tubing	50 25a50 50
Seamless copper tubing	45 50a48 00
Seamless brass tubing	41 00a45 00
Seamless bronze tubing	54 00a ....
Full lead sheets	11 00a ....
Cut lead sheets	11 25a ....

OLD METALS.—The following prices are current for old metals:

	Cents per pound	
Copper—	Buying.	Selling.
Heavy cut & crucible	28.00a29.00	30.50a31.00
Heavy and wire	27.00a27.50	29.50a30.00
Light and bottoms	23.50a24.00	25.50a26.00
Heavy machinery comp.	24.50a25.00	26.50a27.00
Brass, heavy	16.50a17.00	18.50a19.00
Brass, light	13.00a13.50	15.00a15.50
Lead, heavy	9.00a 9.25	9.75a10.00
Tea lead	7.50a 8.00	8.50a 9.00
Zinc scrap	6.75a 7.00	7.50a 8.00

The buying prices are those which the larger dealers will pay; the selling prices are market quotations.

ALUMINUM.—The supply of aluminum is light in the local market and prices are now firm on the basis of 61c to 62c for No. 1 virgin, 58c to 59c for 98-99 per cent. remelt.

No Activity in Rubber Market

There has been no decided change in the rubber market since our last writing. A slight falling off in the prices of plantation grades has been recorded recently. Quotations on June 8th were:

Para—Up-river, fine, per lb.	74 a 74½
Up-river, coarse	51 a 52
Island, fine	71 a 72
Island, coarse	34½a 35
Caucho, ball, upper	48½a 49
Caucho, ball, lower	46 a 47
Cameta	36 a 36½
Ceylon—First latex, pale crepe	77 a 77½
Brown crepe, thin, clean	73 a 74
Smoked ribbed, sheets	77 a 77½
Centrals—Corinto	50½a ..
Esmeralda	50 a ..
Guayule, Satillo	44 a 45
Balata, sheets	84 a ..
Balata, block Ciudad	69 a ..
Mexican—Scrap	48 a ..
Frontera	49 a ..

Domestic Scrap Rubber

African—Massai red	63 a ..
Tires—Automobile	6½a 6¾
Bicycles, pneumatic	4¾a 4⅞
Inner tubes, No. 1	24½a ..
Inner tubes, No. 2	12¼a ..
Red	12¾a ..

MOTOR TRUCK CLUB DATA

The last monthly meeting of the Motor Truck Association of Phila., before the summer adjournment, was held on Wednesday evening, 16th, at the Hotel Adelphia. War topics occupied the attention of a number of the speakers and a resolution presented by Lee J. Eastman was passed, registering a protest against the proposed five per cent. war tax bill on the gross sales of motor trucks. The Association decided to forward the resolution to the Pennsylvania Senators and Congressmen at Washington, asking their co-operation to modify the tax, as it was regarded as discriminatory and confiscatory.

A Committee of five was also appointed to go to Harrisburg to protest to the State Legislature against the passage of pending legislation there affecting transit conditions in Philadelphia, on which subject Oscar C. Beasley, representing the United Business Men's Association, addressed the truck men, pointing out the injurious effect the proposed legislation would work against this city.

Capt. S. L. Gans, of the United States Army Medical Corps, made an appeal to the Association members to co-operate with the Government in furnishing chauffeurs for the Stonemen's Ambulance Unit, and other units required for the army, and asked that they be sent to Cooper Battalion Hall, 23rd and Christian Sts.

Pres. O. W. Doolittle stated that the naval coast defense was in need of machinists for the naval reserves.

Walter M. Wood, General Secretary of the Y. M. C. A. here, spoke on the efforts being made in this city to raise $100,000, for the establishing of Y. M. C. A. units in mobilization and training camps and at the front in Europe. He urged his hearers to support this movement and to contribute to it, stating that the Y. M. C. A. in war time is to the fighting man what the Red Cross is to the wounded soldier and told graphically of the dangers which beset the enlisted man from a social standpoint, while he is away from home. Three million dollars is being raised throughout the country for the establishing of Y. M. C. A. units.

Chas. M. Ripley, of the General Electric Co., gave an illustrated talk on Electric Railway Motive Power; E. J. Cattell, City Statistician, spoke on the advance of modern transportation in fifty years; Forrest H. Riordan read a paper on selling automobile trucks, and R. Arthur Bittong in humorous style travestied all of the remarks of the preceding speakers.

F. G. Browning, Chairman of the Entertainment Committee, outlined the plans for the annual outing at Kugler's Mohican Club on the Delaware, Saturday, June 16th.

Personal Items

A. C. Ambler has been appointed manager of the G M C truck line for the Leach-Frawley Motor Co., San Francisco, Cal.

A. C. Bagley, formerly credit manager of the Hess-Bright Mfg. Co., Philadelphia, has become manager of the credit department of the Motor & Accessory Manufacturers, New York City.

G. A. Benton has been appointed city salesman for the Northwest Buick Co., Spokane, Wash., and will handle G M C trucks.

G. M. Bicknell has been appointed sales engineer of the Carter Carburetor Co., of St. Louis, Mo., with entire charge of the factory sales in and around Detroit, and of all the company's engineering work in the field. He has been associated with the company since shortly after it was organized.

W. G. Clay, assistant sales manager of the Abbott Corp., has been made sales manager, while Alfred Thompson, formerly sales manager, has been advanced to the presidency, succeeding Guy Morgan.

B. F. Cullen, former factory representative of the Smith Form-a-Truck has resigned to take charge of the truck sales for the Henderson-Rowe Co., Washington, D. C., handling Kissel Kar trucks.

R. L. Doyle, late sales engineer and assistant to the sales manager of the General Motors Truck Co., has moved to Indianapolis and taken charge of the truck department of the Cadillac Motor Co., 11th & Meridian Sts.

Fred L. Gayton, formerly with the Goodyear Tire & Rubber Co., has joined the forces of the United States Tire Co. Mr. Gayton is in the truck tire department and will have his headquarters in New York.

Robert T. Gebler has been appointed advertising manager and assistant sales manager for the Martin Truck & Body Corp., York, Pa., maker of the Atlas truck. He was formerly advertising and sales manager for the Keasby & Mattison Co., Ambler, Pa.

S. Snyder Goldberg has become affiliated with the Berney-Glenny Motors Co., 822 Howard Ave., New Orleans, La., and will sell Jeffery and Stearns-Knight pleasure cars and G M C trucks.

Ralph Kaye, specialist in automobile advertising and publicity, has assumed charge of the advertising and publicity department of the Kissel Motor Car Co., Hartford, Wis.

L. W. Kennedy is now special truck tire representative of the United States Tire Co. in the Southern District, with headquarters in Atlanta.

Victor W. Kliesrath, for many years chief engineer of the Bosch Magneto Co., of Springfield, Mass., and New York City, has severed his connection with that company.

Jas. H. McConnell has been appointed manager of sales for the newly organized Shotwell Pump & Tank Co., Indianapolis. He was formerly connected with the S. F. Bowser and Wayne oil tank and pump companies.

Tom McGough, has become a salesman for the Smith Form-a-Truck and will have his headquarters with the Standard Auto Truck Co., Montgomery, Ala.

A. Lundborg, assistant production manager of the Continental Motors Corp., Detroit, has been made production manager, succeeding F. W. Sutton, resigned.

R. S. Oberling has been appointed purchasing agent for the Denby Motor Truck Co., Detroit, Mich. He succeeds K. A. Morrison.

Henry F. Russel, formerly with Lumen Bearing Co., has been appointed sales manager of the Grey Iron Foundry Department of Farrar & Trefts, Inc., Buffalo, N. Y.

Howard B. Smith has become western New York and northern Pennsylvania distributor for Kissel pleasure and commercial cars, with headquarters in Buffalo, N. Y.

E. G. Soward has been appointed assistant sales manager of the Smith Form-a-Truck Co., Chicago, Ill.

Edward Sprague and W. J. Lytle, Jr., have become associated with the Fiske Co., 834a Main St., Worcester, Mass., and will sell the Vim truck.

S. A. Upson, formerly of the Elmer Auto Co., Hartford, Conn., has joined the sales force of the Smith Form-a-Truck agency, 273½ High St.

Factory News

Cadillac Auto Truck Co., Cadillac, Mich., maker of the Acme truck, has increased its capital from $200,000 to $330,000.

Russel Motor Axle Co., North Detroit, Mich., has increased its capital from $250,000 to $600,000, and has declared a 100 per cent. stock dividend. The company has also purchased the gear plant of the Russel Wheel & Foundry Co., which has been virtually a Russel property, ownership of the two companies being nearly identical. By this purchase the axle company is assured of an adequate source of supply of differentials and internal gears, not only at once, but because of the large expansion of the gear plant that is to be made.

Wilson, J. C., Detroit, increased its capital stock to $1,000,000 to take care of the great increase in the motor truck business and to provide for further expansion.

Indiana Truck Sales Co. has been organized by C. W. McDaniel and C. H. Bell for the sale of Indiana trucks in central Indiana. The salesroom and service station will be located at 431 N. Capitol Ave., Indianapolis.

Old Reliable Motor Truck Co. is erecting a 2-story addition, 100 x 160 ft., to cost $90,000, in Michigan Ave. near 39th St., Chicago, Ill.

Krebs Commercial Car Co., Clyde, O., the Lincoln Motor Truck Co., Detroit, and the Clyde Cars Co., Clyde O., have been merged into one company under the name of the Clyde Cars Co., and will market five models of trucks, which will be known as the Clydesdale. C. R. Dunbar is president of the new concern; J. C. L. Krebs, vice-president and general manager; W. P. Dodge, assistant treasurer and sales manager; J. B. Crockett, Treasurer, and Homer Metzger, secretary. All tools and materials of the Lincoln concern have been removed from Detroit to Clyde, and ground will be broken shortly for new buildings.

New Truck Agencies

Ashton Blum, 748 Baronne St., New Orleans, La., has taken the agency for the Maxfer trucks.

Easton Auto and Repair Co., 5610 Easton Ave., St. Louis, Mo., has taken the agency for the Master truck.

Estera-Buiz & Co., 10 Broadway, New York City, has contracted for the agency for the Kissel cars and trucks in Mexico.

W. H. Gibbs, Wilkesbarre, Pa., has taken the agency for the Koehler truck.

Gramm-Bernstein Motor Truck Co. has established its own agency in New York, under the direction of C. W. Moody. The office of the new sales corporation will be at 1457 Broadway.

Albert S. Holly has been appointed general sales manager of the Geo. W. McBride Co., Inc., Boston, Mass., distributors of the F. W. D. truck.

Johnson Auto Co., Vincennes, Ind., has taken the agency for the Vim light delivery truck in addition to the G M C line.

O. B. Judd, Reno, Nev., has taken the agency for the G M C trucks.

Mack Bros., Reno, Nev., have taken the agency for the Service truck for the entire state of Nevada and part of northern California.

GOULD ALLEN

Has become sales manager of Fuller & Sons Manufacturing Company, Kalamazoo, Mich. He has had wide experience in handling transmissions.

SAMUEL J. GREEN

For some years western district general manager for the American Ever Ready Co., now general sales manager of the Detroit Battery Co.

H. A. GRUBB

Formerly Texas manager for the Firestone Tire & Rubber Company, has become assistant district manager, succeeding E. W. Besaw.

E. W. BESAW

Now assistant general sales manager of the Firestone Tire & Rubber Company, Akron, Ohio. He joined the Firestone concern in 1912.

BIDS RECEIVED ON GOVERNMENT TRUCKS

A large number of truck makers were present at the opening of the bids on military trucks for the Government, at the Quartermaster's office of the Central Department, U. S. A., at Chicago, Sunday, June 10th. There were separate bids on chassis and military bodies for the Class A and Class B trucks. The body specifications were drawn by the Quartermaster's Department. Some firms showed a tendency to change specifications more or less but it is doubtful if the Government will accept any changes in the specifications. Some firms also bid without tops or covers and others bid on the canvas tops. There were strikingly few makers who bid on the Government specifications; nearly all offered substitutes in the way of their own models or other changes. Then, firms like Packard, Kelly-Springfield, White, Federal, Locomobile, and one or two others offered special propositions and placed a limit on time as to price, in several cases the quotations being advanced after July 1, August 1 and August 15. Of all the firms that bid, over 100, apparently only one offered a cash bond, that firm being the Thorne Hill Wagon Co., Lynchburg, Va., which enclosed a check for $200,000 with its bid. The Schacht Co., Cincinnati, offered to take 25 per cent. of the sales price, if awarded a contract, in Liberty Bonds.

As soon as the body bids are classified Government inspectors will inspect plants and then make the awards. It is understood that price will not entirely determine the awards, but that size of plant, quality of workmanship and ability to turn out the goods in the fastest possible time will be considered. Many firms bid on these bodies in lots of 400 and upward, the greatest amount bid on being 10,000, while contract to build 70,000 will be awarded.

In the truck end it is understood that awards will not be made immediately, but that these bids have been collected by the department so that the Government can learn exactly what each maker will do when the time comes to call for more trucks.

FROM CARRIAGES TO AUTOMOBILES AND ACCESSORIES

Morgan Potter Mfg. Co., of Beacon, N. Y., for more than 30 years engaged in manufacturing an accessory to the carriage trade, has decided to become active in the automobile field. The name has been changed to the Morgan Potter Motor Co. and the factory facilities will in future be devoted to the automobile industry. Morgan Potter, the founder of the business and for more than 30 years at its head, will be president of the new company and will take an active interest in the same. The company will not only manufacture trucks and truck attachments for converting the Ford and other cars into trucks but will also make a light truck and a medium priced 4-cylinder, 5-passenger touring car. All of the products will bear the trade name of Beacon.

Bids on Class A and Class B Trucks

Some firms bid on their own models and others as per specifications of the War Department.

Firm	Quantity	Class A.	Class B.
Bowling Green Motor Car Co., Bowling Green, O.	2000	$2875	
Pierce-Arrow Motor Car Co., Buffalo, N. Y.	800 (2-ton model)	3500 (5 ton)	4300
	800 bodies	250 (bodies)	300
	100 2-ton Del. 8-4-15	3090	
	100 Bodies	200	
Globe Motor Truck Co., St. Louis		1786	
Norwalk Motor Car Co., Martinsburg, W. Va.	(1 ton)	1135	
Staver Co., Chicago			3900
Oneida Motor Truck Co., Green Bay Wis.	75	no quotation	
Winther Motor Truck Co., Kenosha, Wis.	Own Spec.		2964
	Gov't Spec.		2850
Gramm-Bernstein Motor Truck Co.		2790	3100
Noble Motor Truck Co., Kendallville, Ind.	25	2100	
Velie Co., Moline, Ill.	1—5,000 chassis	2700	3150
	bodies attached	205	255
Fageol Motors Co., Oakland, Cal.	100 (2 ton)	3500 50 (3½)	4600
Stegeman Motor Car Co., Milwaukee, Wis.	1000 (Gov't Spec.)	2515	2945
Witt-Will Co., Inc., Washington	12 (own Spec.)	2365	
Day-Elder Motors Corp., Newark, N. J.	(own Spec.)	1200	
Denby Motor Truck Co., Detroit, Mich.	(own Spec.)	2425 offered other prop.	
Sullivan Motor Truck Corp., Rochester, N. Y.	1400 own model		3058.50
United Motors Co., Grand Rapids, Mich.	Own Spec.	2300	2870
	Gov't Spec.	2825	3375
Indiana Motor Truck Co., Marion, Ind.	600	2562	3226
Willys-Overland Co., Toledo, O.	10,000	Cost plus 15 per cent.	
Republic Motor Truck Co., Inc., Alma, Mich.	3000 A-300B steel wheels	2100	2575
	wood wheels	2025	2500
Garford Motor Truck Co., Lima, O.		2730	3537
	bodies	255	288
Wichita Falls Motor Co., Wichita Falls, Tex.		2950	3800
Acason Motor Truck Co., Detroit	750	2400	2900
Dorris Motor Car Co., St. Louis	Chassis only 200	2115 (100)	2932.83
Sandow Motor Truck Co., Chicago Standard	750	2443	
Consolidated Motors Corp., New York	(own Spec.-535)	2125	
	with body mounted	2375	
	Gov't Spec. chassis	2250	
Kissel Motor Car Co., Hartford, Wis.		2627	
Stewart Motor Corp., Buffalo, N. Y.	600 (Chassis 50 per cent. overload)	1785	
Forschler Motor Truck Mfg. Co., Inc., New Orleans, La.	Gov't Spec. 60	2055	
Riess & Co., New York			3500
Bethlehem Motor Truck Co., Allentown, Pa.	I-5000 with bodies	2365	
	chassis only	2175	
Hurlburt Motor Truck Co., New York		2350	3900
			4200
Rowe Motor Mfg. Co., Downingtown, Pa.		2595	
	bodies	480	
Locomobile Co. of America, Bridgeport, Conn.	1000		3871
	500		3972
	250		4024.57
	less		4074.82
International Motor Co., New York	700 (Own Spec.)		4175
Service Motor Truck Co., Wabash Ind.	(Service Models)	2900	
	bodies	235	
Clyde Cars Co., Clyde, O.	1500	2465	3220.90
Peck & Son, Cedar Rapids, Ia.	150	1950	
Denneen Motor Car Co., Cleveland	Proposition 1-250-500 bodies		3423
	2 no bodies		3541
	3 body		3276
	4 no body		2966
Packard Motor Car Co., Detroit	3000—Gov't Spec.	3474	4950.70
	Own model B.	3173	4125.23
	After Aug. 10, increase $700.		
	Also offered number of propositions on own models.		
White Motor Co. Increase in price after July 1st and Aug. 1st		3150	3820
Signal Motor Truck Co., Detroit	Stock models	2300	3600
Bourne Magnetic Truck Co., Philadelphia	Own models	2750	
Schacht, G. A., Motor Truck Co., Cincinnati		2650	3200
Tower Motor Truck Co., Greenville, Mich.		1840 or cost plus 10%	
Tractor Producing Corp., New York	Four-wheel drive		4235
Transport Tractor Co., Inc., L, I., N. Y.	100		4380
James Cunningham Son & Co., Rochester, N. Y.	100		3000
Acme Motor Truck Co., Detroit, Mich.	600		3000
Atterbury Motor Car Co., Buffalo, N. Y.	1-500		3500

Nash Motors Co., Kenosha, Wis. 2465

Bids to supply 70,000 bodies for Class A. and B. motor trucks of 1½ and 3-ton capacity with and without canvas tops, as per specifications furnished by the Quartermaster's Department.

Firm	Address	Class A.	Class B.
London Auto Top Co., Chicago	with top	$187.50	$197.50
Hercules Buggy Co., Evansville, Ind.	with top	203	
A. P. Shogren Co., Chicago	with top	220	265
Peter Schutler Co., Chicago	without top	170	205
Seelo Mfg. Co., Chicago	with top	275	290
Detachable Limousine Co., Chicago	without top		237
Metropolitan Carriage Co., Bridgeport, Conn.	with covers	262.50	273.31
Collings Carriage Co., Camden, N. J.		300	
		or plus 10% over cost material	
Lang Body Co., Cleveland, Ohio	with cover	235	265
Lang Body Co., Cleveland, Ohio	200-2000	230	260
Lang Body Co., Cleveland, Ohio	3000	225	255
Studebaker Co., South Bend, Ind.	without tops	173	201
Turnbolt Wagon Co., Defiance, Ohio	without tops	172	200
Kentucky Wagon Works, Louisville, Ky.	without tops	171.80	199
American Auto Top Co., New York, N. Y.	with tops	485	445 (no top)
Hopkins Mfg. Co., Hanover, Pa.	with tops	218	249
Commercial Auto Body & Mfg. Co., Cleveland.	with tops	255	280
London Auto Supply Co., Chicago	without tops	175	185
Robt. Mitchell Co., Cincinnati	without tops	190	224
Wright Carriage Body Co., Moline, Ill.	without tops	178.25	214.50
O. Armleder Co., Cincinnati, O.	without tops	178.80	215
Troy Wagon Works, Troy, Ohio	without tops	177.50	213
Commercial Motor Body Co., St. Louis	with covers	298.50	324
Geo. B. Martin Co., Brooklyn, N. Y.	without covers	194	
Universal Top Body Co., Jonesville, Mich.	with covers	274	
J. L. Clarke Car Co., Oshkosh, Wis.	without tops	175	210
Moline Plow Co., Moline, Ill.	without tops	172.50	201
Thorn Hill Wagon Co., Lynchburg, Va.	without tops	170	203
Deere & Co., Moline, Ill.	without tops	162.09	195.73
		or cost plus	
Winkler-Grimm Corp., South Bend, Ind.	without tops	187	224
McCabe Power Car Co., St. Louis, Mo.	with covers	260	285
Highland Body Mfg. Co., Cincinnati	without covers	178	215
Grand Rapids School E. Co., Grand Rapids, Mich.	with covers (10,000)	230	240
Continental Car Co., Louisville, Ky.	with tops	240	259
	without tops	188	195
Wayne Wagon Co., Kenosha, Wis.	without tops	170	204
Maremont Mfg. Co., Chicago, Ill.	with tops	400	450
Indiana Wagon Co., Lafayette, Ind.	without tops	169.50	203.50
Mulholland Co., Dunkirk, N. Y.	without tops	200	240
Kuntz & Co., Cleveland, O.	with covers	211	251
Stratton & Co., Defiance, Ohio	with covers	194	199
Woonsocket Wagon Mfg. Co., Woonsocket, R. I.	with covers	210	235
Monahan Vehicle Co., Providence, R. I.	with covers	242	262
Metz Co., Waltham, Mass.	with covers	228.90	313
	without covers	182.50	249
Peters & Co., San Francisco	with covers	245	
T. R. Wilson Co., Detroit, Mich.	with covers	225	263
Freuhauf Trailer Co., Detroit, Mich.	with covers	425	445
Wilson & Co., Detroit	with covers	224	264
Forbes Mfg. Co., Kentucky	without covers	170	200
Body Dept., Ohio Floor Co.	with covers	312	348
Eagle Wagon Works, Auburn, N. Y.	without covers	169.50	194.50
Reycroft Bros., Topeka, Kans.	with covers		451
Mogul Wagon Co., Hopkinsville, Ky.	without covers	170	200
Stoughton Wagon Co., Stoughton, Wis.	without covers	180	215
Granz Wagon & Co., St. Louis, Mo.	without covers	212.50	
	with covers	262.50	
Wichita Car Works, Wichita, Kans.	with covers	325	
J. G. Brill Co., Philadelphia, Pa.	with covers	214	249
Watson Wagon Co., Canastota, N. Y.	without covers	178	214
Maguire-Cummings Co., Chicago, Ill.	with covers	250	275
McDermott Body Corp., Long Island, N. Y.	with covers	385	426.50
Spalding Mfg. Co., Grinnell, Ia.	with covers	230	300
Dekalb Wagon Co., Dekalb, Ill.	without covers	202.21	274.16
F. A. Ames Co., Owensboro, Ky.	with covers	263.86	300.20
Hoover Wagon Co., York, Pa.	with covers	cost plus 10%	
Kratzer Carriage Co., Des Moines, Ia.	with covers	230	300
Moreland Motor Truck Co., Los Angeles, Cal.	with covers	320	345
International Harvester Corp., Chicago	without covers	157.50	183.50
Columbia Wagon Co., Columbia, Pa.	with covers	248.50	

(Monday bids on trucks of ½ to 1 ton appear on the following page)

THE SOLUTION OF THE FOOD PROBLEM

Tractor and Implement Manufacturers Must be Placed on Preferred List, Otherwise the Farmer Cannot be Expected to Outdo Himself. Tractors are Standing Idle for Want of Plows

WITHIN the past two months reams of paper have been filled with farming propaganda, exhorting the American farmer to strain every muscle to cultivate every available square foot of ground; in simple words, to intensify his farming operations to the highest point of efficiency. The Department of Agriculture has distributed literature by the ton to all parts of the country, giving helpful information on producing maximum crops. Garden Clubs, School Clubs, Home Defence Leagues and dozens of other patriotically inclined bodies are "doing their bit" towards averting a food panic. Business houses and large manufacturers are donating ground space, time and money so that their employes can help in this gigantic food drive. All this is commendable of practical patriotism, and even if some of the amateur gardeners do profit only in experience in their first attempt, the lessons they have learned will give them a new life, a real determination to make next year's garden plot count for something.

Optimism *vs.* Facts

We are all too optimistic; in fact, we are prone to let our present optimism eclipse the actual conditions that will manifest themselves next winter. And that condition is a shortage that will be unparalleled in the history of our country unless the farmer, the big western farmer, who holds the reins on the food situation, is given every possible assistance for a clear drive. To him assistance must be given not only in the shape of men and money but, most important of all, in tractors and farm implements.

How can the farmer be expected to increase the production of his land, till more ground than he ever did before unless he can obtain a sufficient number of machines or implements to satisfy his needs? Of what use is it to urge the implement or the tractor man to increase his production if he is not assured an ample supply of raw material? And, finally, how can the finished machines be delivered to the farmer unless ample transportation facilities are assured.

Food-Producing Machinery Should Come First

More implements have been sold this spring than ever before in the history of the industry and there is scarcely a manufacturer who has been able to fill his orders. With the increasing drain on the house supply and the increasing shortage of labor the farmer must naturally turn to those power farming devices which have been developed to increase his efficiency and which replace both human and animal labor.

Naturally, with the country at war, a heavy demand is being made upon the

steel mills for materials to be manufactured into munitions and ships. It is quite true that these products are necessarily important in war time, but are they more important than the feeding of the men who are to operate our guns and man our ships? Can anyone imagine the calamity that would befall our country and our Allies should our food crop be a failure?

The solution of the problem is up to those government officials whose duty it is to see that certain industries are given preference in securing material and transportations, and first on this list should be the tractor and implement manufacturer.

Although steps are being taken in this direction by the Tractor Standards Division of the Society of Automotive Engineers by asking the government to devise means whereby the tractor manufacturer can be furnished with materials, machine tools and labor, still no official statement has been made to indicate that this matter is receiving the attention it deserves.

The farmer stands ready and willing to buy this machinery, but cannot get it. We have urged him to plant every available acre and to clear his ground in order that next fall he may plow and sow another record grain crop. Yet, in Fargo, S. D., only two weeks ago, 135 tractors, each of which was owned by a farmer with the land to be plowed, stood idle because plows could not be obtained. The plow makers, in turn, claim they cannot get the steel. Is it not high time, therefore, that someone of authority in the implement business be appointed a member of the National Council of Defence? This Council is composed of a really wonderful organization of executives, who rank high in their particular fields. The duty of these men is to see that all the resources of the country are properly co-ordinated and that each industry shall be given assistance in the order of its importance to the welfare of the nation.

But the implement and tractor manufacturers have no representation and they, the implement and tractor manufacturers, are having to advise their dealers that they cannot get the steel to furnish them with implements which their dealers and branch houses tell them are absolutely necessary in order that the crop yield can be increased.

The implement industry, and this includes the tractor industry at this time, is critically up against it. No one on the Council realizes the part that farm equipment must play in the business of war. It is an industry which bids fair to be overlooked in the general preparation and an industry which plays a vital part.

Please, Mr. Somebody, put Mr. Cormick, Mr. Brantingham, Mr. Peek, Mr. Railsbach or Col. Bruiton on the National Council of Defence and get behind the manufacturer of the tools which produce food.

If we overlooked the manufacture and the greatest possible production of these tools, we undo all that we have done in urging the farmer to plant the greatest possible acreage.

Bids Were Opened Monday, June 11, at the Office in Chicago of the Depot Quartermaster, for Trucks Ranging in Capacity From One-Half to One Ton. The Bids Were as Follows:

Form	½-ton	¾-ton	1-ton
Metropolitan Motors Co., New York City....		$895.00	$1080.00
Bethlehem Motor Truck Co., Allentown, Pa...			1095.00
Norwalk Motor Car Co., Martinsburg, W. Va..			1135.00
Economy Motor Co., Tiffin, Ohio	708.75		
without top	25.00		
Commercial Vehicle Motor Corp., Chicago....		695.00 50 @	1190.00
		150 @	1290.87
Seneca Motor Car Co., Fostoria, O.....	643.00		
Commerce Motor Car Co., Detroit .....offer 1000 but no quotations			
Forschler Motor Truck Mfg. Co., Inc., New Orleans, La.		1625.00	1825.00
Illinois Auto Truck Co., Chicago (Ford Unit).	(Ford)	660.00	
	(Dodge)	1050.00	
Maxwell Motor Co., Inc., Detroit			795.00
Continental Truck Mfg. Co., Superior, Wis...	cab, stake, panel bodies extra—No bid		
Smith Form-a-Truck Co., Chicago (Ford Unit)	627.46 (Dodge)	1102.50 (Ford)	627.46
		(Dodge)	1102.50
Superior Motor Truck Co., Atlanta, Ga.....			1250.00
Hudford Co., Chicago .....Hudford attachment		397.00 Comp. Unit	714.70
Vim Motor Truck Co., Philadelphia .....Catalog price, 1500 lbs.			
Koehler, H. J., Motors Corp., Newark, N. J...			1075.00
Beck & Son, Cedar Rapids, Ia.			1080.00
Maxfer Truck Co., Chicago		(Dodge Unit)	1246.60
		(Ford Unit)	784.30
Packard Motor Car Co., Detroit			1860.00
		After Aug. 10th	2232.00
Larrabee-Deyo Motor Truck Co., Binghamton, N. Y.		July	1440.00
		After Oct. 1st	1540.00
Studebaker Corp., Detroit	From $663.75 to $693.75		900.00
		to	1125.00
Garford Motor Truck Co., Lima, O.		1657.50	1855.00
	Military Body	245.00	250.00
Selden Motor Vehicle Co., Rochester, N. Y...			1810.80
Willys-Overland Co., Toledo, O.		722.50	
	½-ton	¾-ton	1-ton
Lippard-Stewart Motor Car Co., Buffalo, N. Y.	1140.00		
worm drive	1215.00	1740.00	2250.00
Abbott & Downing Co., Concord, N. H.....			1700.00
Nash Motors Co., Kenosha, Wis. Model 2017			1232.50
Rush Motor Truck Co., Philadelphia. Model F	750.00		
Ex body	845.00		
Panel body	870.00		
Martin Truck & Body Co., York, Pa.....	chassis	900.00	
Brinton Motor Truck Co., Philadelphia, Pa...			1125.00
International Harvester Corp., Chicago .....Model H with body		1235.00	
without body		1160.00	
Commerce Motor Car Co., Detroit .....Model E			1240.00
Republic Motor Truck Co., Inc., Alma, Mich...			1350.00
Federal Motor Truck Co., Detroit .....also cost plus 10%			1485.00
Reo Motor Car Co., Lansing, Mich.		946.00	
Denneen Motor Car Co., Cleveland, O.....		860.00	1344.00
Rainier Motor Corp., New York City.....	without		
chassis	875.00 lighting	1020.00	1875.00
lighting	940.00 with l'tg	1085.00	
Collier Motor Truck Co., Sandusky, O.....		900.00	
	after Jan. 1, 1918	1000.00	

McQUAY-NORRIS SUES ALBERTSON & COMPANY

McQuay-Norris Mfg. Co., St. Louis, Mo., maker of Leak Proof piston rings, was recently granted an injunction against Albertson & Co., of Sioux City, Ia., with damages, by Judge Reed of the United States District Court at Sioux City. He sustained the copyright of the McQuay-Norris Mfg. Co., covering their book "Dimensions of Piston Rings," and held that a book of piston rings published by the Albertson concern was an infringement, and issued an injunction against any further distribution of the Albertson Co.'s books. He also ordered undistributed copies of the book delivered up to the complainant and assessed financial damages.

PROMOTIONS MADE BY GOODYEAR TIRE & RUBBER COMPANY

The Goodyear Tire & Rubber Co., Akron, O., has made the following promotions: C. M. McCreery, formerly assistant manager of the Chicago district, is now special manufacturers' representative for that district. W. S. Boone, supervisor of city sales in Philadelphia, is now special manufacturers' representative for the New York district. G. H. Barmore has been transferred from branch manager at Milwaukee, Wis., to assistant manager of the Chicago district. A. J. Sears, formerly branch manager at Sioux City, Iowa, succeeds Mr. Barmore as branch manager at Milwaukee. W. A. Ziegler has been promoted from city salesman at Milwaukee to branch manager at Sioux City, Iowa.

Our Motor Truck Industry in the War

It is Well Prepared for the Big Job Ahead of It

By LEE L. ROBINSON

THE motor industry and the motor owners of the United States are standing at attention, ready to do their bit for their country in connection with the war against Germany, and both the industry and the owner are not only willing but ready for service to an extent doubtless little appreciated by the country at large.

On the authority of Col. Chauncey M. Baker, the Quartermaster's Corps of the Army, the purchasing branch, it can be stated that as soon as the army of 1,000,000 men is recruited the Government will award contracts for trucks in large numbers. These trucks will be distributed on the division plan, or as rapidly as divisions of the army are organized, the trucks will be furnished them.

That the motor industry will play a most important part in the war, especially in transportation work, is conceded. It also will be called upon to supply armored cars of various makes. Col. Baker stated, in response to an inquiry, that the motor industry is in wonderfully fine shape and considering that the United States produces six times as many cars, passenger and trucks, as the rest of the world, it calls for but an easy stretch of the imagination to conceive of the possibilities for supplying the Government's motor needs.

Further, a standard truck for 1917 has been agreed upon by representatives of the Motor Transport Committee, of which Alfred Reeves of the National Automobile Chamber of Commerce, is chairman; the Society of Automotive Engineers, represented by Coker F. Clarkson and others; the American Automobile Association, represented by A. C. Batchelder, and the United States Army, represented by Colonel Baker, and it is now before the Secretary of War for review. His approval of the standardization of the truck for army purposes is expected.

Profiting by Experience in Mexico

Colonel Baker stated that it is customary to revise the army truck standard each year, the army heads profiting by experience as the years go by. The trucks used by the Pershing expedition into Mexico, and by the forces along the Mexican border afforded the army experts excellent opportunities for studying them in active service, and the Government got many good ideas which may now be put into effect.

Colonel Baker stated further that the Army now has 2,600 motor trucks, a nucleus on which to build. Howard E. Coffin, chairman of the Advisory Commission of the Council of National Defense, who, together with the Motor Transport Committee, has been giving close attention to the matter of co-ordinating the motor car resources of the country for emergency service, and quickening the development of standardization of motor vehicles for such needs, says that any emergency call for motor transportation which may be issued by the military authorities in any district will be promptly met.

The organization of truck owners throughout the country is being pushed by the A. A. A., and Mr. Batchelder of that organization is enthusiastic over the manner in which they are responding to his appeals. He is also giving close attention to the transportation question from the standpoint of the highways of the country, and has prepared an elaborate map for use of the army heads showing the principal highways of the country, their connections, the ones especially leading to military bases, and those which could be utilized in emergencies to reach coast stations.

Women Learning to Drive Ambulances

Mr. Batchelder states that highway enthusiasts over the country and motor owners, both passenger and truck, are cooperating in the heartiest way possible. Various motor truck corps are being organized, made up of both men and women. An initial organization of women has its headquarters in Washington, the duties of those who enlist and agree to hold themselves in readiness to answer a call being the driving of motor truck ambulances as an adjunct to the American National Red Cross. The wife of Representative Gardner, of Massachusetts, is chairman of the Washington organization of women ambulance drivers, and she is organizing branches all over the country, in the centers.

The women who have offered their services are studying the technical end of machines, that they may be able to handle road problems. No woman who has driven a car less than one year is accepted. A big army truck used in Mexico is in service here as a demonstration car for these women, and they are required to crank the machines, put on tires, and do anything necessary to operate them under varying conditions.

That the American truck has met the tests to which it has been subjected remarkably well so far suggests that it is the peer of any made for army uses. Such trucks, in the hands of experienced operators, once they are put in the field in the numbers called for by the Federal Government, will aid to a remarkable extent in solving the transportation problems for an army of 1,000,000, which the Government expects to have inside of a year.

Another gratifying situation today, with respect to possible demands of the Federal Government, and the ability of truck manufacturers to meet them, is found in reports received by the War Department to the effect that the industry is remarkably well equipped to handle orders in large numbers. Colonel Baker, discussing this phase of the situation, says he has been not only pleased but amazed at the completeness and extent of the organizations of an industrial character in the United States.

The Council of National Defense, through its various agencies and committees, has been working for a year to the end that the industries of the country might be properly mobilized should a call be made upon them in a national crisis. A survey of the most detailed character has been made of the different manufacturing establishments, and the character of organization, the kind of craftsmen employed, the mechanical equipment, and the capacity of practically every factory of any kind in the country is on record in the vaults of the Council.

Not only this, but the plants which, if necessary, could be converted to uses other than the present ones, are known, and their possible capacities when so converted. The automobile industry, being one of the largest in the United States, naturally has come in for close attention, and its plants have been zoned, as it were, and catalogued. Should the demand from the Government for trucks be as great as is now anticipated, the chances are few plants manufacturing them will be converted to the making of munitions, for instance, but will be kept busy supplying their usual output.

Government Not to Impede Industry

It is not believed in Washington that the different automobile and other manufacturing establishments will be called upon to supply the Government to the exclusion of their private business, the governmental heads being anxious to interfere as little as possible with the usual commercial activities in making calls for supplies. In addition, the various committees of business men named by the Chamber of Commerce of the United States, selected to co-operate in the various sections with army purchasing depots, are engaged upon a plan for buying which will protect both the Government from excessive charges and the manufacturer from unusual and embarrassing demands.

As a general proposition, a buying plan which will give the manufacturer cost plus 10 per cent. profit seems most likely to be generally observed. In this the truck manufacturers are included.

Therefore, as a whole, the outlook is that the motor truck will figure largely in all plans for the utilization of the great army now being organized, and that the manufacturers and the private owners will be found doing a patriotic duty in aiding the Government in every possible way.

American Motor Trucks in Army Work

A Collection of Photographs of American-Built Cars That Have Made Remarkable Records in Europe and Mexico

By GEORGE BROWN

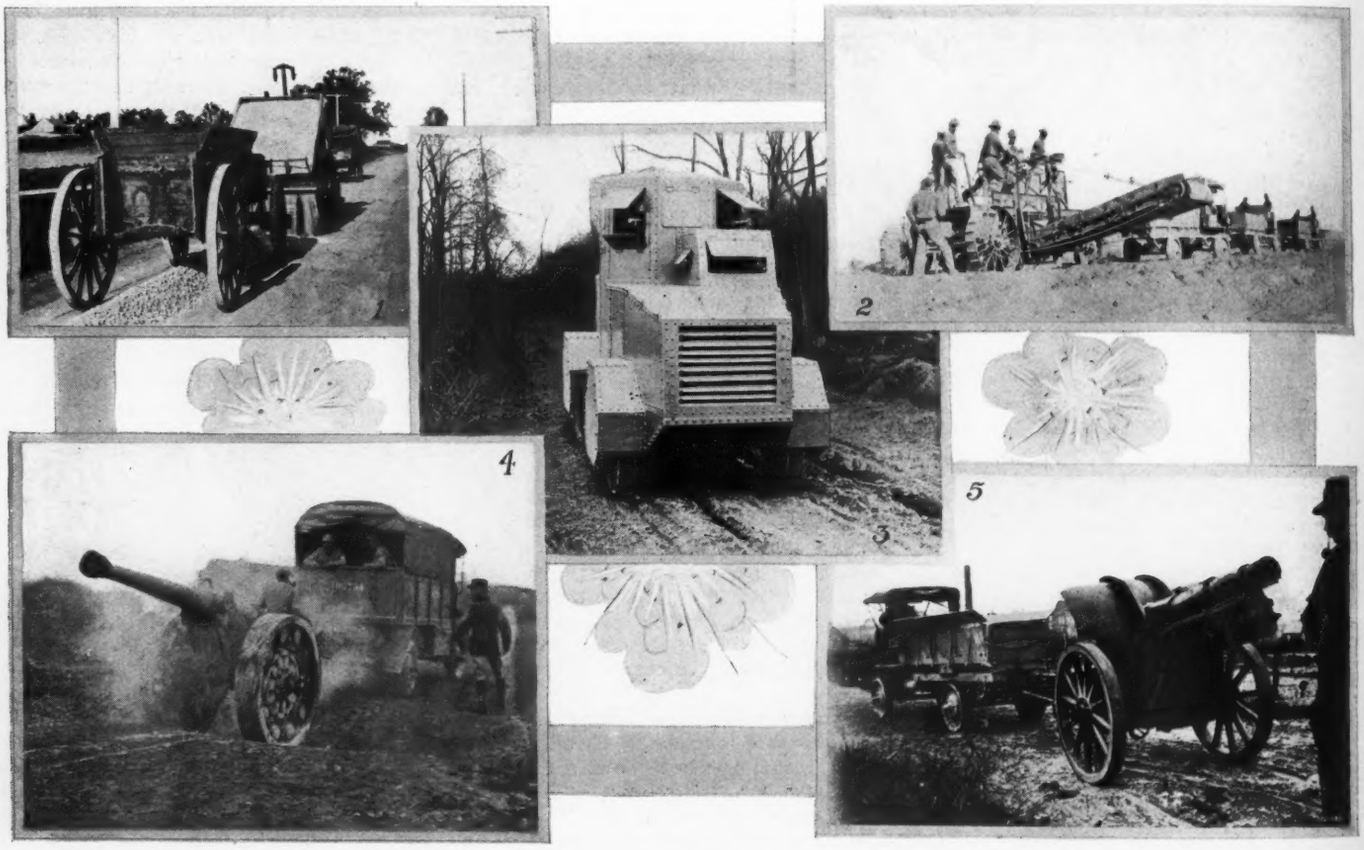
IT is a very few years since an intelligent motor truck manufacturer, or even salesman, would claim that a motor truck's usefulness was possible other than on pavements. He might qualify that by saying on good roads. Even so recently as the mid-summer after the outbreak of the European war, when the writer suggested to a sales manager and one of his associates, during the bad business motor truck prospects in 1914, that as a business relief he might try to sell his product to the Allies, the answer was, "They are building their own trucks." He was right as far as he knew, but the conversation took place before the battle of the Marne.

The writer then remarked that battles are not fought on good roads. Even then, his ideas were most decidedly vague as to trench warfare, nevertheless, he said, "Well our trucks have most decidedly the advantage over the foreign product at least in clearance, and battles are not fought on either good or bad roads, exclusively." The sales manager agreed that that might be a good point and he would look into the matter. His corporation since that time have disposed of motor trucks running into the millions of dollars to the Allies and orders are as yet unfilled.

Apparently this was the initial move to open a great market for the American motor truck, although, only a short time ago this same sales manager, while admitting the conversation was an inspiration to go after the business, said that he had merely pushed the button while the "higher-ups" secured the money and the glory from the gory paths of the American trucks "somewhere in France." In Greece, the Balkans, Russia, and wherever armed forces were engaged in Europe, Asia, or Africa, the efficiency of our motor truck product has been seen and felt from the munition plants in Great Britian to as far East as Suez. They have climbed the Alps and have negotiated their way laden with food, munitions and ammunition, even over fields plowed by the shots from the heaviest artillery; nothing has stopped them but cannon balls and shells, although now and then a bomb from an airplane may have demolished one, or a fleet. The war performances of American-built motor trucks have established their supremacy and have placed these vehicles in an unassailable position as to their usefulness for the purposes for which they were constructed.

In Mexico, without a battle or a gun fire, with the Pershing punitive expedition, they were again put to the test of the most severe transportation conditions. To be sure, there were roads, both good and bad, to roll over and then, road-making machinery was part of the equipment of the expedition, and yet, the service was arduous to a degree and unquestionably a real test.

Many of the accompanying illustrations are used by the courtesy of Merl LaVoy, who was granted special permission by the French government to take the photographs on the front of the Allies in action, under the auspices of the American Relief Clearing House of Paris. Mr. LaVoy is the only American photographer who has secured both photographs and motion pictures on the trench lines in action and his motion pictures with the American truck prominently shown are now being exhibited in our cities.



Jeffery "Quads" in Place of Horses in Military Service

1. Truck with dump body and trailer repairing roads somewhere in France. 2. Russell road-making machine drawn by three "Quads", a part of the Pershing punitive expedition into Mexico. 3. On the Allies' front. An armored "Quad" going into action. 4. Somewhere in France, moving five tons of artillery to the front. 5. Another artillery hauler in France.

Motor Trucks Do the Heavy Work for the Army

6. Fleet of "Quads" moving with the Pershing expedition in Mexico. 7. One of General Pershing's transports taking water in Mexico. 8. In France: These troop motor transports carry thirty-five men each. Thus, great bodies of men are moved expeditiously. The low clearance of these foreign trucks is noticeable. Their success is on good roads. 9. Truck taking a bath after discharging its freight in the trenches in France. 10. Uncle Sam's boys with Pershing, following the trail in Mexico. 11. Down to the hubs, somewhere in France, a Jeffery laden with food supplies for the Allies. 12. Taking a high embankment—in France. 13. Where they did not even have a road—in Mexico.

Why is the CCJ the only truck paper a member of the Audit Bureau of Circulations? Here's food for thought

Trucks and Our War Problems

Gigantic Burden of Speeding Industry and Agriculture Offers Greatest Opportunity to the Trade

By FRANK REED

WAR is making its imperative demands upon our national forces. Today we are in the period of card indexing and preparation of plans and instructions. Tomorrow we enter the period of mobilization and emergization of our resources in men and materials. It is a struggle in which superior organization of mechanical forces means not only victory but a victory bought at a reduced price in precious lives. Metal, concrete, wood and petroleum are to be pushed forward to save flesh and blood.

Europe has supplied the experience that will govern the initial planning and execution of the utilization of motor trucks in the thousand and one phases of administering to the needs of the men in the battle line and immediately behind the front. The great problems of this phase of the nation's needs are in the hands of our military authorities and the heads of the great truck manufacturing industries. But what of the problems of the trade—the distributors and agents—who have, in five years, accomplished a revolution in speeding up and rendering efficient the short-haul transportation of men and goods over the highways?

War Means Intensified Internal Transportation Activity

Speed and control will be emphasized more intensely than ever before in history as fundamentals in our great agricultural, mining and industrial processes. Intensification of these activities will be nation-wide. Those who look for a revolution in our national activities will be disappointed. The over-imaginative truck dealer who marks time, waiting for conditions to change, will handicap himself even more than the dealer of sluggish mind who simply plugs along in the old rut because he lacks the mental nimbleness to figure out a modified course. On the other hand the truly progressive dealer is shaping his activities to take care of immediate emergencies first, but fundamentally to strengthen conditions which will prevail in the peace after the war, as well as during the actual conflict. There are few, indeed, of the fundamental activities of national life that will not be intensified. Speed will become a necessity instead of a mere advantage. So likewise will become co-ordination and control of all movements. As these qualities become more intensely essential in all phases of transportation in every locality the motor truck, which supplies them, becomes a fundamental. Is there a risk that high authorities will adopt a short-sighted policy and drag to the battle front and behind the lines the nation's resources in transportation that are needed in every highway to transport fuel, food and the countless raw and manufactured goods essential for the continuance of military and civil activities at increased speed? If there is such a risk today it will quickly be destroyed when the experienced judgment of the trade shows public opinion the correct course. The day the Government declared the existence of a state of war automatically broadened the field of every truck dealer in the United States.

Truck Supreme in Mobilization

Encampment and supply during the training period offer the initial opening to the motor truck dealer. The supremacy of the motor truck in meeting the requirements of mobilization has been thoroughly demonstrated. It avoids the separation of men and equipment, supplies the medium for efficient control by a minimum number of officers. It gives the volume efficiency essential to large movements. The ability of the truck to offset road speed of touring cars through these factors of volume and control in larger units, producing better synchronization of movements, has been a surprise to many who have witnessed comparative tests. This fact, once demonstrated, as it now stands, opens to dealers everywhere a new field for activity, in developing methods of mobilization and supply. Military authorities have shown a liberal minded facility in grasping the opportunities afforded by the initiative and experienced judgment of motor truck dealers.

Reproduction of battlefield practice is said to be a fundamental feature of the intensive training plan for our soldiers. Here again is involved a volume transportation problem, for men and supplies. The motor truck will here find utilization in enormous numbers as it has in actual battlefield conditions behind the lines in Europe.

Tractors, Trailers and Trucks in Agriculture

Getting results with a minimum of man power is the gigantic problem of the American farmer in this war. Preparation for a long period of doing his part to feed the world is engaging the attention of every farmer. This obligation will endure for a long period whether peace comes soon or late. This very fact of expected duration is operating to aid the financing of farming operations which becomes imperative. The money to provide the farmer with mechanical agencies must be provided. The duration of the period of its use, the certainty of demand and adequate prices for agricultural products, assure, as never before, an adequate and attractive return on capital so invested. The truck dealer in the city has hitherto generally adopted a waiting attitude toward farm and ranch business. Today his business opportunity and his patriotic duty coincide in pointing toward his taking an increased initiative in developing the sale and financing where necessary, of motor transportation for agricultural products.

Enormous increase in tillage means a tremendous impetus in tractor utilization on large-area farm units, or in districts which may be co-operatively tilled by tractors, even though owned in moderate acreages.

The development of small acreages to manifold increased productive capacity means that every little farmer will find profitable use for a trailer behind his "flivver."

With an agency covering tractor, trailer and truck who can say that the progressive dealer will not have to hustle to keep ahead of his competition to supply the market the war is making in the tillable lands he has hitherto neglected on account of uncertainty of results and high selling expense.

Mining Field Also to the Front

Minerals will come out of the ground in tonnages that will astonish the world. New mines have a habit of being discovered far from the rails. Old mines that have been withheld from development by slow and costly transportation are being worked, or prepared for working, at full capacity. Motor trucks have fully demonstrated their power and reliability to cope with the exceptionally severe conditions of mine haulage. Where the demand for ore transportation increases, this demand will be filled by trucks.

Viewpoint of Fundamental Industries Required

Truck dealers now have an opportunity to apply the training in "grasping the other fellow's business problems" that has become a part of the sales method of the industry. War brings a certain revision in the list of the industries which are fundamental. Peace will bring another revision—which will not be wholly a reversion to the conditions of yesterday. The truck dealer who succeeds in a big way has big problems to consider. Picking the best prospects is no longer a game of spotting the big stables and replacing them with fleets and garages. It gets down to picking the fundamental industries in each locality, foreseeing their expansion, and fitting transportation into their schemes of development. And always in the future must be reckoned that great need of conserving the man power of the nation. Now, above all, man's time is too precious to be tied down to the plodding pace of the horse. That much we know. We cannot afford to let every three horses mean that dilatory capital is making a slacker of a man who should be using his efficiency for the benefit of the nation. Patriotism sweeps the horse aside.

NICKERSON & SCHROEDER, distributors for the Maxfer Truck Maker in New York City and Brooklyn, have secured an order from the Coca-Cola Co., for 87 truck makers.

Tractors and the Great War

Importance of Mechanical Power in the Service of the Army

By COKER F. CLARKSON*

MECHANICAL traction has been utilized to a very large extent in the great war. The war could not be conducted in anything like the manner it is being conducted, without the use of tractors, not to speak of motor trucks, motor boats and railroads.

It has been appreciated for a long time that mechanical power can be employed in many ways for the transportation of troops, supplies, munitions of war and guns. A great quantity of tractors are now in use on this basis and the United States Government will undoubtedly have many thousands in such service within a relatively short time. The haulage of field guns by European armies has been largely by mechanical power and a great deal of development work has been done by the Ordnance Department of our army. In fact, we have in this country the first completely motorized field artillery battery, this having been developed and used experimentally and for work at Fort Sill, Okla. The Ordnance Department is doing a great deal of advanced work at this time. Some of the best trained officers of the army are devoting their entire attention to the subject and several of the prominent members of the Society of Automotive Engineers are also engaged in the work. President George W. Dunham, of the Society, is the civilian member of the Ordnance Department Board for the Motorization of Field Artillery; Major Lucien B. Moody, Major Dan Moore and Captain Capron are also members of the Board.

Advantages of Motor Gun Hauling

There are many logical reasons in favor of the substitution of motor-driven apparatus for horses in the marshalling of field guns. Horses of the type required are becoming more and more scarce and costly. It has been established that certain types of ground, difficult to negotiate, can be covered by the use of tractors when this would be impossible with horses. The tractor, as a whole, is in one sense more vulnerable to gun fire than a field artillery team of eight horses; on the other hand, the tractor can work longer and be repaired within shorter time than is required generally for a horse to recover from any ailment. Sentimental reasons, of course, are in favor of the horse being emancipated from the frequently extremely heavy work of gun haulage. It seems very likely that greater development of tractors of the military type will redound to the benefit of the commercial users of tractors.

The use of tractors in the European War was based very largely upon commercial development of American engineering products and since the war American engineers have forged ahead and will undoubtedly bring about increasingly gratifying results at an early date.

The Tractor Standards Division, of the Society of Automotive Engineers, of which H. L. Horning is chairman and George T. Strite, C. M. Eason, Fred Glover, E. R. Greer and Raymond Olney are members, is co-operating in several fields of tractor progress, including that having to do with the heavy ordnance work. Mr. Horning is a member of the Automotive Committee of the Advisory Commission of the Council of National Defense, as representing the tractor interests. The manufacturers of passenger cars, motor trucks, parts and accessories for automotive apparatus, aircraft, watercraft and motorcycles are also represented on this committee which has within its jurisdiction some matters of a commercial nature, as well as those involving engineering problems.

The great potentiality of the farm tractor in the solution of the world's food problem is well appreciated. However, many points are involved in the adequate production and use of farm tractors. The average farmer does not understand sufficiently the merit of the tractor as a tool for him and is not trained as he should be in the operation of the mechanical apparatus. Any machinery ever produced requires some attention at regular intervals. There are well-known cases of tractors which have failed in the hands of some owners and been highly successful in the service of owners who had some adequate knowledge of the attention actually required by the machines. The agricultural press is rendering a national service of the highest value in making plain the requirements that can be met easily by reasonable effort in the forward march of intelligent modern farming.

Without doubt a great deal of tractor development, as an immediate result of military activities, is at hand and in sight. The most spectualar feature of this development is the military work but the production of crops in greatly increased quantities is a consideration second to none in the national welfare. The work of the Society of Automotive Engineers applies at many points of contact and the results that will be achieved by it through well organized proceedings now in effect will be as important and striking as any with which this remarkable organization is to be credited.

GLOBE MOTOR TRUCK CO., St. Louis, Mo., announces that it has made several changes in its managing and engineering departments. Walter F. Sheehan has become general manager. C. T. Schaefer has joined the engineering department as chief engineer. The company is now producing 1, 1½ and 2-ton trucks.

Some of the Going Encountered on the Novel "On to St. Louis" Tour

Accompanying the pleasure cars on the "On to St. Louis" tour of the San Francisco Advertising Club is this Moreland distillate truck. This was the only commercial car entry, and the only entry from Southern California. This truck carries the drinking water, tires, etc., so as to lighten the burden of the touring cars as much as possible.

* General Manager, Society of Automotive Engineers.

The Petroleum and Gasoline Situation*

By VAN H. MANNING†

AS a nation, when it comes to our heritage of splendid natural resources, we are wasteful, apathetic and forgetful. We waste our natural resources with shameful prodigality; we are apathetic of the future. Any remedy that can be applied to the petroleum and gasoline situation will come through conservation, which does not mean tying up, but a wiser use of what we have.

In 1916 there were 2,750,000 automobiles, or an increase over 1910 of 2,350,000. The increased number of automobiles in 1916 used a billion more gallons of gasoline or 28,000,000 bbl. more than the automobiles in 1910.

This increased use of gasoline for the increased number of automobiles alone represented a little more than half of the total output of gasoline in the country in 1916 for all purposes, the total production being about 54,000,000 bbl. And when you realize that the number of automobiles is increasing with each day, you can grasp what a tremendous problem is this feature alone.

The total gasoline engine horsepower built and sold in the United States in 1913, according to the Federal Trade Commission, was 11,200,000, and in 1915 the output had a little more than doubled, the figures being 22,500,000, an increase in gasoline horsepower of 100 per cent. in two years.

These figures indicate the increased use of gasoline-power more clearly than those which cover only the automobiles, as these include all types of gasoline-driven machines which have been developed and increased in use in a way no less surprising than that of the automobile itself.

The apparently unsolvable puzzle about this is that while we have been increasing our production of gasoline, the production of automobiles has increased 200 per cent. above the increase in gasoline production.

Statistics indicate that of the gasoline produced in the United States, between 55 per cent. and 60 per cent. is used in automobiles; 20 per cent. to 25 per cent. is exported, and the balance is used in stationary engines, in motor boats, tractors and for various purposes of minor importance.

Demand for Gasoline Rapidly Increasing

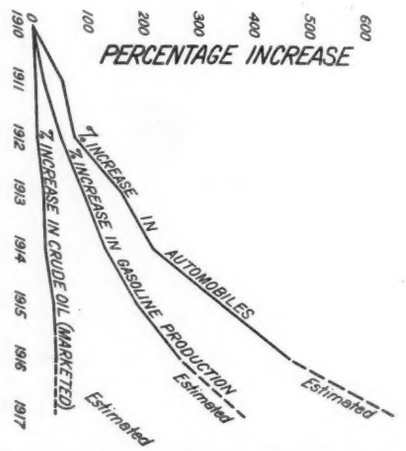
As the highways of the country are improved, the commercial trucks, consuming large quantities of motor fuel, are becoming important means of transportation in many localities. The fishing fleets of our entire coasts have installed gasoline power to replace their original sailing equipment. These fleets, with the many pleasure craft, operated mostly in the summer months, when the production of gasoline is most heavily taxed, use large quantities of this convenient liquid fuel. There seems no reason to believe that the call for gasoline will in any way be reduced, in fact, a much larger demand seems imminent.

*From an address before the Editorial Conference of the trade and class publications at Washington, May 25, 1917.

†Director of the United States Bureau of Mines.

Petroleum and its products have become essential to our very existence. Gasoline is a very important product, but there are many others. The operation of hydroelectric generators, of railway and trolley cars, of the machinery of the factories, of internal-combustion engines, of our battleships and our merchant ships; in fact, of all machinery is made possible by the use of lubricating oils, and these come from petroleum. Petroleum lubricates the machinery of the nation from the handicraft of the watchmaker to the dreadnaught of the Navy.

The industry has progressed since its beginning a little over half a century ago, when it was possible to store the entire



Comparative Increases in Numbers of Automobiles and Quantities of Oil Products

production in tin cans and wooden barrels, to the present, when the annual quantity produced requires great steel, concrete and earthen reservoirs for its storage, great pipe lines for its transportation and fleets of specially constructed vessels for its exportation.

The stored reserve of petroleum is the most stabilizing influence in the industry. During the last few months our increased consumption has made it necessary to draw oil from this storage, which has convinced many people that our present supply has reached a point where it may never again be sufficient to fill easily the demand placed upon it, unless some radical steps are taken to conserve its use. One of these steps frequently mentioned, and one that is slowly dawning upon our consciousness is that the burning of crude petroleum under boilers for the generation of steam ought to be stopped. In this way large quantities of priceless by-products are being consumed. Some of the western railroads are beginning to change their oil-burning locomotives to coal locomotives. One of their reasons in the past for burning oil was that it was cheaper than coal, but this reason is fast disappearing.

In 1916 the market production of crude petroleum was, according to the estimate of the United States Geological Survey, 295,000,000 bbl. The stocks held by various pipe-line and transportation companies at the end of January, 1916, according to various trade journals, amounted to approximately 170,000,000 bbl.; at the end of 1916 the stocks amounted to 150,000,000 bbl., which represents a decline of 20,000,000 bbl., even in the face of our greatest annual marketed production of 295,000,000 bbl.

What of the Future?

If consumption of crude petroleum exceeds production, the difference must be drawn from storage. The question that naturally presents itself here is what of the future? During 1915 the normal consumption of crude petroleum was 12 per cent. greater than in 1914; and last year our consumption exceeded the 1915 consumption by 13 per cent. Estimating that the normal peace consumption for this year will increase at the same rate, or 13 per cent., our consumption for 1917 will exceed that for 1916 by about 40,000,000 bbl. This does not take into consideration the increased demand for petroleum and its products due to the entrance of this country into the war. Although this increased demand because of the war is difficult to estimate, obviously the increased use for various war purposes will greatly enlarge our consumption above the rate which prevailed during times of peace.

The production of crude petroleum in this country during last year is thought to have reached high-water mark, and it is very likely that the production for 1917 will be smaller than it was last year. If the normal and war demands for petroleum can be filled, the difference between the estimated production and consumption during this year will amount to probably as much as 60,000,000 bbl., an amount which must be drawn out of storage. With only about 150,000,000 bbl. of crude petroleum in storage at the first of this year, and with the prospect of it becoming necessary to draw from that reserve probably 60,000,000 bbl. to fill that demand, it becomes more apparent that some radical steps must be taken to meet the situation.

It may be that as the shortage becomes more apparent the demand may lessen, but the calculations as given show the present tendency of our supply and demand and make it of the most importance to meet the situation with as little confusion as possible in our industrial life and without in any way hampering the outcome of the war.

We should not pass over the situation with an optimistic statement that when the time comes new fields will be discovered, as has happened in the past, or that new methods will be found whereby this threatened shortage will be overcome. We should undertake to anticipate this problem as best we can for we certainly will encounter it in the not distant future.

While the present increase in the number of pleasure cars may not continue, it is

plain that the use of gasoline for power in many commercial fields has not yet fully developed and as this use widens it will more than overcome any falling off in the rate of consumption of gasoline in the cars used for personal purposes, if such falling off should occur.

The fact we must face is that the production of petroleum is not increasing as rapidly as the production and consumption of gasoline. The petroleum in time will reach its maximum production and start to decline. What we are doing now is looking to more efficient methods of production from the oil sands, the production of more gasoline by the so-called cracking process, the extraction of vapors from natural gas, and the utilization of liquid fuels from other than petroleum bases.

More efficient methods of production are now being developed, such as the Smith-Dunn process for forcing oil from the sand by the use of air or gas under pressure.

The cracking of petroleum last year furnished 7½ per cent. of the total gasoline production and can be and is being developed and installed rapidly in most of the larger fields of the United States.

The treatment of natural gas by compression, refrigeration, and absorption produced 60,000,000 gal. of gasoline of such low boiling point that it was mixed with equal parts of naphtha to form 120,000,000 gal. of good motor fuel. The compression and refrigeration process of extracting gasoline from natural gas, when first used, treated only gases containing 3 gal. or more of condensable vapors, but at the present time the development of the process and the increased price of the product make gas carrying one gallon profitable. The extraction of gasoline from gases containing less than one gallon and as small a quantity as one pint per 1000 cu. ft. is now being profitably carried on by the absorption process, which is well adapted to treating lean gases in large volumes. Another source of petroleum which will undoubtedly be developed in time is the shales containing considerable quantities of oil but which, at present prices of crude oil, cannot be extracted commercially.

Substitutes for gasoline, such as the products of the distillation of coal, are being used at present in Europe for motor fuels, and may in time be used for that purpose in this country, as many by-product coke ovens are now being constructed.

In the periods of readjustment and in the development of latent resources, I am hopeful that the Bureau of Mines will play an important part. At present, besides endeavoring to meet the problems of today, the bureau is looking ahead and preparing to aid in solving the problems of tomorrow by investigating the possibilities of increasing the present production.

The accompanying chart shows the percentage of increase in the number of automobiles and the percentage of increase in the production of gasoline and crude petroleum since 1910. The lack of parallelism of these curves indicates what may be expected in the future, especially in the motor fuel market and illustrates the general situation perhaps better than figures.

VACUUM STREET-CLEANING MACHINE

The city of Los Angeles has contracted for the use of four vacuum sweeping machines, conditioned for the sweeping of 1,200,000 sq. yds. of pavement per day at a cost of 10½ cents per 1000 sq. yds. swept.

This sweeper is built by W. E. Baxter, of Los Angeles, Cal. Two machines have been in operation since October 2, 1916, and four machines since October 31. The machines are worked in two shifts of eight hours each: 1 day shift, at present from 1 P. M. to 9 P. M., and 1 night shift from 9 P. M. to 5 A. M. The machines are equipped with different width brooms or sweeps, ranging from 12½ ft. to 13½ ft. A 13-ft. broom is being used at present. Each sweeper sweeps from 130,000 sq. yds. to in excess of 200,000 sq. yds. per day of eight hours. They operate at a speed of 3½ m.p.h. and during an eight-hour day travel from 25 to 30 miles.

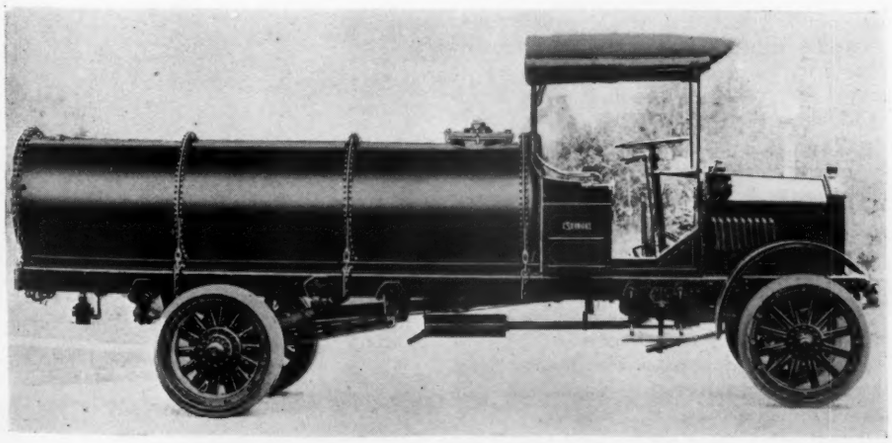
The vacuum action of the apparatus is achieved by a centrifugal pump, located upon the top of the machine, this being operated by the engine, which also drives the vehicle.

The Baxter Street Cleaning Machine Attached to a Moreland Truck

As the sweeper is proceeding along the street the dirt on the pavement is encountered first by a stiff street broom, which loosens it and gets it ready for the vacuum device. Immediately behind the broom is the vacuum arm, which has a sweep of about 10 ft., or almost three times the width of the truck itself.

After being drawn from the street by the vacuum arm the dirt is carried along the arm to the drum at the center. After passing through this drum it continues up a pipe located near the forward end of the large tank itself, where it remains until the emptying process takes place, this being accomplished by tipping the receiving tank backward, whereupon the dirt falls by gravity through an opening in the rear. The broom and vacuum arm may be raised.

The machines are used on pavements with a smooth surface such as asphalt, oil, macadam or brick. Probably 99 per cent. of the area swept is asphalt pavement. It is doubtful whether the machine will do satisfactory work on rough pavements, such as granite blocks, etc., as the broom or sweep could not come in contact with the whole surface, but on smooth, dry streets they do very satisfactory work. They will not clean wet or muddy streets, but are well adapted to work such as is found in Los Angeles, where there is very little wet weather and where practically all streets are paved with asphalt.



Special Tank Body Used for Hauling Soft Drinks

The average person is accustomed to seeing soft drinks hauled in cases, but when it comes to hauling great quantities of soft stuff, the Pfaudler Company, of Rochester, N. Y., resorts to the outfit illustrated above. This is one of a fleet employed by this company. The tank is built in three interchangeable sections with demountable heads. The sections are lined to the edge on the inside with Pfaudler glass (Silicate) enamel, which is fused with the open-hearth steel shell at very high temperature. The enamel is insoluble and will not chip or crack under temperature variations.

Keep Prosperity Going*

THE President's admirably devised summons to the civil forces of the nation, urging the need for increased production of food and other supplies and the conservation of stocks in hand, has had the curious effect of creating a sense of depression and alarm.

This deplorable feeling is shown in the hasty selling of securities, in face of the fact that the proceeds of a huge bond issue are to be expended in this country for supplies with the almost certain result of increasing the market value of the stocks being sacrificed.

It is actually shown in widespread inclination toward hoarding, when gilt-edged securities are available in any quantity. It is shown, too, in the closing down of factories in the presence of urgent demand for almost everything that machinery and labor can make, and likewise in a tendency to curtail the purchase of anything beyond the actual necessaries of existence.

It is fortunate that there is a competent and authoritative source of influence to counteract this mistaken movement. Nothing could be more timely than the statement issued by Howard E. Coffin, of the advisory commission of the Council of National Defense, warning against indulgence in "hysterical demands for economy in every line of endeavor." "Waste," he says, "is bad, but an undiscriminating economy is worse," and he continues:

> "Some states and municipalities are stopping road building and other public works. General business is being slowed down because of the emotional response of the trading public to these misguided campaigns for economy. We need prosperity in war-time more than when we are at peace. Business depressions are always bad, but doubly so when we have a fight on our hands.

More Business Needed During War

> "The declaration of war can have no real evil effect on business. We need more business, not less. Indiscriminate economy would be ruinous. Now is the time to open the throttle. To the billions which have been spent here by foreign nations are now to be added billions of our own. State activities, road building, public works, private industries, all must go on as before. Business must be increased, labor employed and the country kept going strongly ahead as a successful economic machine. We must have successful industries if successful tax levies are to be raised."

This is sound sense, intelligent patriotism, the logic of self-interest and national safety. Industrial and commercial activities, which mean prosperity for all, are now on an upward swing, and the one force that can retard the movement is a distorted conception of what economy and conservation of resources mean.

The vital need is not cautious inertia, but aggressive efficiency. Waste must be eliminated, useless extravagance should be avoided; but the American standard of living should be maintained, and the nation's constructive forces should have freer play through the encouragement of every sound commercial activity. The surest way to lose the war would be to permit the natural processes of our economic existence to become disorganized through depression; the surest means of bringing victory and early peace is to stimulate those processes by steady concentration upon our ordinary affairs and steady adherence to rational habits of life.

That there will be some restriction in available food supplies is more than likely; for, no matter how much we may produce, there will be an excess of demand, since it will be our imperative duty to send to the nations holding the battlefront for us every pound of food we can spare without weakening our own economic capacity. But the public should not take a possible food shortage to mean a shortage of work or a recession in wages or a scarcity of money. On the contrary, employment will be plentiful, wages high and money abundant.

Urgency of Intensified Production

Above all, it requires increased production. The farmer, the truck grower and the stock raiser should intensify their efforts, and every family with an available plot of ground should utilize it to ease the demand upon the general store. But instead of these needs making for depression or panic, they provide the most favorable condition for increased prosperity. It is impossible to make a panic out of such factors as production stimulated by overwhelming need and a demand for labor greater than the supply.

The single item that seven billions of dollars—a sum so stupendous that mind cannot grasp it—is to be expended here, is enough to dissipate all uncertainty. It was the expenditure of the first $50,000,000 on materials for the Allies that started the business of the country booming; when it was realized that they would need $1,000,000,000 worth of our products, the flow of prosperity became a torrent; the force of that is still felt, and now it is to be multiplied seven times.

Colossal sums will be needed, of course, to carry on the war, and much of the money must be raised from taxation. But if the Government is wise—and it seems to be—it will not permit this need to lay a burden upon industrial and commercial prosperity, but will distribute it upon incomes, where it can most equitably be borne. Industries should not be checked by new levies; the revenues should be derived from their earnings, after they have been distributed in the form of dividends.

There is a double reason why productive enterprise should not be penalized. Industry should have free play in order that its growth may be manifested in increased wages and the most effectual national preparedness; and also in order that it may be developed to the high potentiality which it will need, when the war closes, to meet the relentless competition of the highly organized productive energies of Great Britain and France and Germany.

In our judgment, there are three considerations which should be borne in mind.

First, the approach of the food shortage does not in any manner or degree threaten calamity. It might become uncomfortable, even severe, without checking the sweep of prosperity.

Second, the most direct and effectual provision against this pressure will be increased production of food supplies, achieved by means of tireless energy on the part of all who can in the smallest way help in the work. This will tend to keep prices within moderation and will contribute more than any other one thing to hasten peace and promote the cause of humanity.

Third, and most vital, our activities of production and distribution, of manufacturing and business, must be kept going and stimulated. We cannot make war without vast revenues, and we cannot raise vast revenues without general prosperity.

Depression, timidity and panic-mongering would be the certain precursors of defeat and disaster. Patriotism and self-interest alike demand that Americans make the most of the tremendous resources at their command and of the mighty force of prosperity which is lifting them to a place of unexampled power and usefulness in the world.

* From an editorial in the Philadelphia North American.

GASTON, WILLIAMS & WIGMORE, INC., have moved their offices from the Guarantee Trust Bldg. to the Equitable Bldg., 120 Broadway, New York City.

Kelly-Springfield Truck Equipped for Trolley Repair Work

In the service of the Puget Sound Light & Traction Company, Seattle, Wash. Replaces the company's old street cars used for this purpose.

Instructions for Drivers—V

Inspection and Care of Tires; Records and Reports; Names of Car Parts; "Don'ts"

Compiled by E. S. FOLJAMBE

INSPECTION AND CARE OF SOLID TIRES.

TIRE expense is one of the greatest connected with truck upkeep. This item, however, is largely within the control of the operator.

Overloading is responsible for more unsatisfactory solid tire service than any one cause. The feature that is not generally recognized either by drivers or owners is the fact that all four tires can be utterly **ruined by overloading but once.** Explanation: If a piece of rubber is **stretched** within its limits it will return to its original shape and condition. If stretched but once to the breaking point, it will never come back to its original condition. The damage has been done. If a piece of rubber is **compressed** within limits it will return to its original shape and condition. In exactly the same way, if it is compressed **but once** beyond its limit, the rubber is actually broken, and it will never come back to its original condition; in other words, its life is destroyed. This means that **one excessive overload, although the truck may be able to stand it, may entirely ruin the life of all four tires,** and they will go to pieces very rapidly afterward. To the eye there is nothing to indicate that the tires have been injured.

Placing all the heavy articles at the rear so that they can be more readily taken off at the unloading, often brings an excessive overload on the rear tires and causes their permanent breakdown in structure.

Overspeeding is another practice which rapidly wears out the tires. The rapid repetition of pressure and then release, kneads and heats the rubber, especially in hot weather. When at speed, if a car track or other obstruction is struck, the rubber may be permanently damaged at the point of contact, as just explained in overloading.

Skidding also permanently damages tires not only by tearing them loose at the base but by striking obstructions sideways.

Driving in car tracks, as already mentioned, cuts away the rubber until what remains is overloaded, even by the normal load of the truck.

Freshly broken stone, especially when wet, cuts the tires, making numerous pockets into which dirt and sand are forced. In the winter an icy road will often cut the tires in the same way, and more care should be used in driving during this season.

Anti-skid devices, when locked so that they cannot move or creep on the tire surface, are also bad, but if of such a nature that they slowly change their position on the tire surface the damaging effects are practically negligible.

Excessive wear on one front tire usually indicates misalignment of the front wheels due to bent or sprung steering connections. The same thing on the rear wheels indicates that the radius rods are not being tightened alike, and that the axle is being pulled forward on one side. Solid tires should be inspected for looseness or giving way at the base. Scrap ends around the edges of the cut should be trimmed off so that there will be nothing to catch and tear the rubber. Bad cuts should be cared for by the tire repairers, a spare tire or wheel being immediately put on the machine.

Tables of tire capacity are usually supplied by tire makers. The following is such a table by one of the well-known makers:

Maximum Carrying Capacity of Solid Commercial Car Tires.

Size.	Single.	Dual.
3 in.	950 lb.	2500 lb.
3½ in.	1375 lb.	3500 lb.
4 in.	1750 lb.	5000 lb.
5 in.	2000 lb.	6000 lb.
6 in.	3000 lb.	8000 lb.
7 in.	4000 lb.	10000 lb.

TIRE DON'TS

Don't overload.

Don't overspeed.

Don't leave the tires under load over night.

Don't let them stand in oil, grease or gasoline.

Don't let cuts go unattended; have them vulcanized.

Don't drive in car tracks until the tires are cut.

Don't turn the steering wheel while the truck is standing still; this damages the front tires.

Don't start the car with the front wheels cramped; this tends to pull the tires out at the base.

Records.

To obtain thorough satisfaction from any motor-driven commercial car a record of its performance should be kept. This is especially true of trucks in the service of new users.

Drivers should be supplied with a small slip upon which the mileage, the loads, the speeds, extra gasoline and oil and special remarks should be recorded. These should be turned in to the garage foreman at night.

Steering Gear.

Lost motion .....
Adjusted .....
Action .....
Grease boots .....
Connections adjusted .....
Arms and cross rods .....
Lubrication .....

Brakes, Transmission and Rear Wheels.

Condition .....
Adjustment .....
Drums .....
Control apparatus .....
Brake action .....
Lever action .....
Nuts and bolts .....
Lubrication .....

Gasoline.

Tanks leak .....
Dirt in tanks .....
Connections leak .....
Connections clear .....
Carburetor adjusted .....
Carburetor action .....
Control action .....
Amount put in .....

Cooling.

Watch radiator at all times, see that leaks are healed and that it is kept filled with water. Radiator should be drained weekly and kept clean.

Gaskets .....
Couplings .....
Glands .....
Heating .....
Fan .....
Radiator .....
Connections .....
Tank leaks .....
Pump action .....

Ignition.

Batteries date .....
Volts .....Amperes .....
Wiring .....
Coils adjusted .....
Commutator .....
Control action .....
Spark plugs .....
Magneto .....
Lubrication .....

Mufflers.

Noisy .....
Leaks .....
Cleaned .....

Remarks.—Any unusual condition of the car or parts should be reported, with the information as to cause, etc., by each driver, at the conclusion of his run, and he will give details of any repairs made on the road.

Inspection Report.

Inspected by .....
Car No. .....
Date .....19..
Approx. Mileage .....

Important.—Clean oil pan and screen weekly. Put in tablespoonful of kerosene twice a week when motor is warm and let stand over night. Clean spark plugs. Examine wiring and see that all connections are right.

Motor.

Condition found .....
Condition left .....
Oil pan cleaned .....
Oil screen cleaned .....
Oil passages free .....
Oil pump action .....
Oil leaks .....
Cam shaft .....
Bearings adjusted .....
Piston pins inspected .....
Valves .....
Timing gears .....
Noise .....
Control .....
Nuts and bolts .....
Lubrication .....

Transmission and Jack Shaft.

Control .....
Drive shaft .....
Noisy .....
Leaks .....
Bearings .....
Differential .....
Sprockets .....
Nuts and bolts .....
Lubrication .....

Running Gear.

Front axle .....
Bearing adjustment .....
Rear axle .....
Bearing adjustment .....
Wheel fastenings (cotters) .....
Hub caps fit .....
"Set" of front wheels .....
Nuts all cottered .....
Chains adjusted .....
Distance rods .....
Rivets loose .....
Spring hangers .....
Nuts and bolts .....
Springs .....
Lubrication .....

Be sure the distance rods are of equal length, measuring from center of sprocket to center of wheel.

Clutches.

Type
Flywheel .....
Trans .....
Easy engagement .....
Oil collars .....
Leather universal joints .....
Springs .....
Discs .....
Collar .....
Nuts and bolts .....

The following are forms used by the Massachussetts Institute of Technology, and give the various items which should be included in keeping a record of vehicle performance:

PERFORMANCE RECORD.

Period of data .....
Name of truck .....
Capacity .....
Initial cost .....
Age .....
Total mileage .....
Gasoline used .....
Oil used .....
Days used .....
Days out of commission .....
Number of trips .....
Number of stops .....
Total weight of goods carried .....

EXPENSE RECORD.

Operating.

Running repairs .....
Lubricants .....
Gasoline .....
Garage .....
Sundries .....
Driver .....

Maintenance.

Tire .....
Overhaul .....
Painting .....

Fixed Charges.

Amortization .....
Interest .....
Insurance .....
Taxes .....
Total .....

NOMENCLATURE OF MOTOR CAR PARTS.

Adopted By Society of Automotive Engineers.

POWER PLANT.

Fuel System.
Fuel Tanks
Fuel Supply and Strainer
Intake Manifold
Carburetor
Throttle
Hot Air Supply
Pressure Regulator or Pump
Gauge
Pressure Hand Pump

Ignition System.
Magneto
Battery
Switches
Spark Plugs
Coil
Cables
High Tension Distributer and Timer

Cooling System.
Pump
Radiator
Pipes
Fan

Lubricating System.
Tank
Pump or Pumps
Pressure Regulator
Gauge
Leads—Oil
Sight Feeds

Motor.
Piston.
Piston Head
Piston Wall
Piston Ring Grooves
Piston Oil Grooves
Piston Flange
Piston Boss
Piston Pin
Piston Pin Lock
Piston Pin Bushing

Connecting-Rod.
Connecting-Rod
Crank-Pin Bearing, Upper Half
Crank-Pin Bearing, Lower Half
Connecting-Rod Cap
Connecting-Rod Stud—Nut and Lock
Connecting-Rod Oil-Scoop

Valves & Valve Springs.
Inlet Valve
Inlet Valve Spring
Inlet Valve Spring Seat
Inlet Valve Spring Seat Key
Exhaust Valve
Exhaust Valve Spring
Exhaust Valve Spring Seat
Exhaust Valve Spring Seat Key
Valve Rocker-arm
Valve Rocker-arm Pin
Valve Rocker-arm Pin Lock
Valve Rocker-arm Fulcrum Clevis

Cylinders.
Water-Jacket
Covers and Gaskets
Inlet Plug
Exhaust Plug
Pet-Cock

Crank-Case Assembly.
Crank-Case
Crank-Shaft
Flywheel
Starting-Crank
Bearings
Crank-Shaft End
Crank-Shaft Gear—Cam-Gear
Crank-Shaft Starting Ratchet—Pin
Flywheel
Flywheel Studs
Flywheel Key
Flywheel Clutch Stud—Housing
Starting-Crank
Starting-Crank Handle
Starting-Crank Shaft
Starting-Crank Shaft Sleeve
Starting-Crank Bearing—Housing
Starting-Crank Retainer
Starting-Crank Spring

Camshaft.
Push-Rods
Push-Rod Springs
Rocket-Arms
Accessory Drive

Manifolds.
Inlet
Exhaust

Exhaust System.
Exhaust Pipe
Cutout
Muffler

TRANSMISSION SYSTEM.

Transmission.
Case.
Upper Half
Lower Half
Cover
End-Plate

Shafts.
Driving Pinion
Countershaft
Driven Shaft
Countershaft Main Gear
Countershaft First Gear
Countershaft Second Gear
Countershaft Third Gear
Countershaft Reverse Gear

Gears.
Sliding First (low speed)
Sliding Second
Sliding Third
Reverse Idler
Shifter Rod
Shifter Fork

Bearings.
Main Forward
Main Rear
Countershaft Forward
Countershaft Rear
Idler bushing

Propeller-Shaft Assembly.
Forward Universal Joint
Rear Universal Joint
Propeller-Shaft
Tube Rear End
Tube Forward End
Tube Hanger

Jack Shaft Assembly.
Differential and Driving Gear (See rear axle)
Differential Bearings, Right
Differential Bearings, Left
Differential Shafts, Right
Differential Shafts, Left
Differential Shaft Casing
Jack-Shaft Hangers
Sprocket Pinion
Hub
Drive Chain, Center
Drive Chain, Right
Drive Chain, Left

Clutch Assembly.
Cone Type.
Spring Adjusting Screw
Thrust Collar
Male Cone
Female Cone
Facing Spring
Clutch Spring
Clutch Sleeve
Clutch Collar
Clutch Yoke
Clutch Coupling

Multiple Disc Type.
Driving Disc
Driven Disc
End Plate
Inner Drum
Outer Drum
Spring
Spring Adjusting Screw
Thrust Collar
Yoke
Coupling

Expanding or Contracting Type.
Drum
Band
Facing
Spring
Spring Adjusting Screw
Collar
Yoke
Coupling
Expander—Contractor

RUNNING GEAR.

Rear Axle Assembly.
Axle Outer Bearings
Driving-Shaft, Right
Driving-Shaft, Left
Driving Gear Housing
Driving Gear Housing Cover
Axle Tubes—Right Spring Seat
Axle Tubes—Right Brake Support
Axle Tubes—Right Radius Rod
Axle Tubes—Right Radius Adjustment
Axle Tubes—Left Spring Cover
Axle Tubes—Left Brake Support
Axle Tubes—Left Radius Rod
Axle Tubes—Left Radius Adjustment

Housing.
Torsion Bar
Torsion Bar Links
Torsion Bar Springs

Differential.
Bearing—Right
Bearing—Left
Bearing Thrust
Case—Right
Case—Left
Spider
Pinions
Pinion Studs
Gears

Driving Gear.
Pinion
Pinion Shaft
Forward Bearing
Rear Bearing
Thrust Bearing
Adjusting Screw
Adjusting Screw Lock

Front Axle Assembly.
Front Axle
Steering Head
Knuckle, Right
Knuckle, Left
Knuckle Pin
Knuckle Pin Bushing
Knuckle Spindle
Knuckle Arm, Right
Knuckle Arm, Left
Knuckle Thrust
Drag Rod
Tie Rod
Tie Rod End

Frame.
Side Bar, Right
Side Bar, Left
Cross Bar, First Immediate
Cross Bar, Second Immediate, Etc.
Cross Bar, Rear
Cross Bar, Front
Front Spring, Front Hanger
Front Spring, Rear Hanger
Rear Spring, Front Hanger
Rear Spring, Rear Hanger
Jackshaft Bracket, Right
Jackshaft Bracket, Left
Starting Crank Bracket
Radius Rod Bracket, Right
Radius Rod Bracket, Left
Gusset Plate
Step Brackets
Fender Brackets
Pedal Shaft Brackets
Lever Shaft Brackets
Brake Shaft Brackets
Quadrant

Springs.
Front, Right
Front, Left
Rear, Right
Rear, Left
Rear, Cross
Clips
Leaf Retainers
Eye Bolt
Tie
Shackles
Eye Bushing
Pad

Brakes.
Drum
Band
Shoe
Facing
Expander
Contractor
Adjusting Screw
Brake Arm
Relief Spring
Stops

Wheel Assembly.
Hub, Front
Hub, Rear
Hub Flange
Hub Bolts
Hub Cap
Front Wheel Bearings, Inner
Front Wheel Bearings, Outer
Rear Wheel Bearings, Inner
Rear Wheel Bearings, Outer
Bearing Spacers, Front Wheel
Bearing Spacers, Rear Wheel
Spokes, Front Wheel
Spokes, Rear Wheel
Felloe, Front Wheel
Felloe, Rear Wheel
Band, Front
Band, Rear
Rim

CONTROL SYSTEM.

Steering Post Assembly.
Steering Column
Steering Shaft
Steering Wheel
Steering Worm or Pinion
Steering Wheel or Sector
Steering Screw
Steering Nut
Steering Worm Wheel Shaft
Steering Arm
Steering Arm Shaft
Spark Lever
Throttle Lever
Spark Sector
Throttle Sector
Spark Shaft
Throttle Shaft

Hand Lever Assembly.
Gear Lever
Brake Lever
Gear Lever Shaft
Brake Lever Shaft
Gate
Brake Lever Sector
Gear Lever Shaft Arm
Brake Lever Shaft Arm

Pedal Assembly.
Clutch Pedal
Brake Pedal
Reverse Pedal
Accelerator Pedal
Foot Button
Clutch Pedal Shaft
Brake Pedal Shaft
Brake Pedal Shaft Arm
Clutch Pedal Shaft Arm
Secondary Brake Rod
Primary Brake Rod
Brake Equalizer

Don'ts to Prevent Trouble.

Don't forget that your position and pay depend upon satisfactory service.

Don't forget that by looking after your truck you are saving money for your employer and will doubtless better your own position.

Don't stop at corner saloons; the truck doesn't need it and after a few stops you are more likely to have an accident.

Don't waste time when loading and unloading, racing the truck on the road to make it up.

Don't try to speed through bad roads; it will be time lost in the end.

Don't race another car; the truck is built for carrying, not for speeding.

Don't round corners at high speed.

Don't turn the steering wheel while the car is standing still; this is ruinous to the tires.

Don't let the motor race when the truck is standing; a few minutes will do more damage than many miles of hard driving.

Don't leave the truck standing with the engine running.

Don't leave the truck on a hill unless the rear wheels are blocked with stones or other objects.

Don't put a new chain on a badly worn sprocket.

Don't use the water funnel for gasoline or vice versa.

Don't let in the clutch suddenly; always engage it easily.

Don't start or stop with a jerk.

Don't drive fast over car tracks, bumps and road obstructions.

Don't come to a stop by suddenly applying the brakes and sliding the rear wheels.

Don't drive your truck with the brakes on.

Don't overspeed; "steady but sure" is the motto.

Don't overload; there is no surer way of putting yourself out of a job.

Don't start before you are sure that you have oil, water and gasoline.

Don't leave the truck in a cold garage without an antifreezing mixture in the circulating system.

Don't try to start until sure that the spark lever is retarded.

Don't attempt to start until sure the switch is on.

Don't run without oil; "a word to the wise is sufficient."

Don't coast downhill at high speed.

Don't run with the spark too far advanced.

Don't start until sure the speed lever is in neutral position.

Don't put lubricating oil on a leather-faced clutch.

Don't mix oils.

Don't run continuously in the car tracks.

Don't run on the batteries; use the magneto.

Don't leave your extra tires exposed to the weather.

Don't drive fast at corners or on slippery pavements.

Don't let the car drip or smoke.

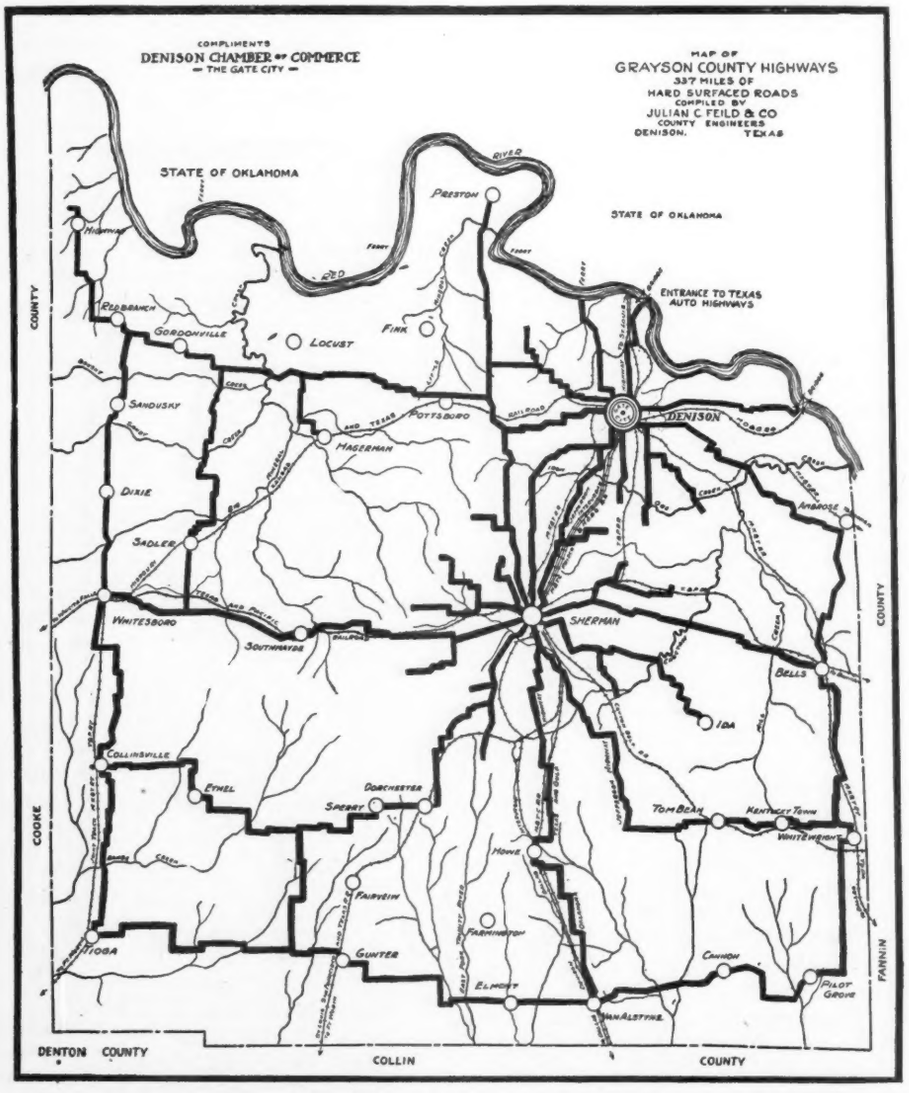
Don't tamper with the governor.

Don't back into a curb or platform, jamming the tires.

Don't see how close you can run to the other fellow's vehicle; keep a safe distance.

Don't drive fast past schoolhouses or other places where children are likely to dart out into the street.

Don't neglect the noises which indicate coming trouble, and, above all, don't forget that there is always another man more capable than yourself ready to take your job if you don't do it satisfactorily.



Grayson County, Texas, Noted for the Extent and Character of Its Highways

Grayson County, Texas, has 337 miles of hard surfaced roads, which represent an investment of $1,750,000. This county boasts of the most complete system of public highways in the Southwest. Grayson County is the gateway to Texas on two international and one interstate auto highways, viz.: the Jefferson Highway, from Winnipeg to New Orleans; the King of Trails, from Manitoba to Houston and San Antonio; and the Oklahoma, Texas and Gulf, from Wichita, Kan., to Galveston.

FIRESTONE SUPERSIZE CORD TIRE

Combining the merits of high grade cord tire construction with the advantages of over-size, the Firestone Tire & Rubber Co. has announced the production of a new and distinctive equipment—the Firestone super-size cord tire.

It is the result of several year's experimenting and testing by tire engineers, builders, testers and chemists, who sought a product that would be a definite and conspicuous improvement in cord tire construction.

The principal advantages of a cord tire are its superior resilience and wearing qualities. It absorbs road shocks, instead of fighting them and because its fabric is not interwoven but made up of thousands of strong, heavy cords imbedded in tough pliable rubber, the cord tire has less internal friction.

The over-size fabric tire was also designed for hard service.

Every Firestone super-size cord is an over-size tire, having the same relative dimensions as the ordinary over-size fabric equipment. It is being built with two types of treads. For rear wheels there is the skidless double F, angled against slip in any direction. The approved front wheel equipment is the triple tread with a corrugated surface and which, like the double F, has its cord body reinforced with specially treated tread rubber of tough and wear-resisting qualities.

GIER PRESSED STEEL CO. has recently moved its office force from North Grand Ave. to its new building on North Larch St., Lansing, Mich.

Success in Selling

By WILLIAM FULTON MELHUISH*

SUCCESS in selling is mainly achieved with a sledge hammer, pile driver, pinch bar, a square jaw, an open mind, plenty of steam and all the sand you can buy, borrow and beg.

The greatest factor of success in my opinion is steam, backed up with honest belief in the merchandise. The salesman who succeeds largely is born a seller—he is a leader among men, has the ability to convey his ideas clearly and concisely to another. It requires a certain knack of expression, an easy flow of language, an ability for conciseness of statement, which is developed to a marked degree in only a few men.

When a sales manager has selected his forces with these attributes in mind, he can begin training and directing with a feeling that he has substantial timber with which to build.

After that it is strictly up to the sales manager to get results, for a salesman unaided by the work of the house in locating prospects, and not supplied with all the necessary follow-up and co-operation, is pushing water uphill. There are few salesmen of real calibre who will long continue to work for such a house.

Steam is the pressure business men put behind things to make them move. Hot air has never been a successful substitute and the only one remarkable thing about it is that so few people have found it out.

It's Push That Makes Things Go

Show me a big business institution and I will show you an organization built on the plan of a compound-triple-expansion engine with solid push back of every valve, and an exhaust large enough to be heard and seen by the whole trade. Mind, I don't say that a small business is any less behind on account of its size. Small businesses usually carry a smaller load and sometimes make better speed. I know a few small establishments that carry a head of pressure like a Mississippi steamboat and they are annihilating competition.

It is those extra few pounds of push—the three or four to top off the safety limit—that just about doubles the speed of the machine and makes the whole institution wheeze.

Suit yourself about a name for it—I call it "steam." It is marked by continual unrest—and occasional shifting about to a new place where the floor space averages up a bit bigger.

Most things that have developed to a point worth while mostly rolled some as a starter.

Mark Twain was a river pilot and notorious for his desire to "keep her hot down below." That same endowment of "git-up" and "git-there" made him a "top-notcher" in the literary field.

Main force is measured by the pound. And it does the business.

An insurance man recently told me that he used tact in getting his business.

All right—that's main force applied with a lever.

You don't pull off your coat and sweat, but the result is exactly the same. The pressure has to be there—full measure to the square inch before she goes.

As to the method of locating prospects. This is simply a matter of tilling the soil. We use advertising. Any man who believes this is a small world should go back to school, especially one of the advertising schools. The applications of advertising are as numerous as the days in the year. In our own case every feature of our truck is an avenue of approach to the dealer and the possible buyer. We advertise continuously and religiously. We apply it in many forms.

A well-known advertising man once said that the infant's first cry for food is advertising of a subtle sort, and that when we die a monument advertises our greatness to posterity.

So life begins with a help wanted ad. and ends with a testimonial.

Having accomplished the results of advertising, I have found the greatest success lies in selecting men who can apply sales force as mentioned in the first paragraph of this article, tempered, of course, with good business judgment and backed up with first-class merchandise.

* President and Sales Manager Fulton Motor Truck Co.

Selecting Motor Truck Salesmen

By R. H. DEYO*

IN my judgment the prime requisite of a good salesman is his ability as a business man. In making truck sales I find that a man of middle age, who has had wide experience, is able to get better results than a younger man. The purchaser, as a rule, expects some guidance from the motor truck salesman and, everything being equal, the man of middle age has the better chance of gaining his confidence. However, this is not a hard and fast rule.

A good appearance and easy manner of address are assets, but the important essential for success is knowing the article one is selling. The salesman should have made a study of conditions surrounding the handling of motor trucks, be keen and observing, and have a general knowledge of the work motor trucks can do at a profit or a saving to the user. When he has acquired this knowledge and presents his facts to the prospective buyer, he must be conservative and not over-estimate the capabilities of the truck he is selling.

A prospect will soon detect the inexperienced truck salesman and he is likely not to have faith in what the salesman tells him unless the salesman knows his business well enough to guide the purchaser and give him sound business advice.

It is not the man who is a "jolly good fellow" who counts in the motor truck selling game. It is the salesman with the ripe experience, a thorough knowledge of the truck he is handling, who always tells the truth, and whose "word is as good as his bond." This is the type of man that is the success today and who benefits the motor truck industry.

It has been our experience that it is extremely difficult to get salesmen with the necessary ripe experience. For this reason there is no better field for the young man who wishes to start at the beginning and work through to the top. He must not expect to become rich or be able to retire during the first few years of his career, but if he has ambition with the above qualifications that make for success, is willing to work hard and is selling a reliable truck there is nothing to prevent him from becoming a substantial success in his chosen line of work.

To the young man I would say:

"The field is unlimited for you if you start selling trucks with determination, 'stick-to-it-iveness,' and a willingness to learn. You naturally cannot expect to be a howling success from the start.

"If you are willing to gain your experience by hard work, there will be no question of your ultimate success if you handle a dependable truck backed by a good company.

"You alone must educate yourself, either through your superiors or your own initiative.

"Be strong enough to sell the truck at the price your company asks for it, and on their terms. The weak salesman will endeavor to make bad sales stick, and try to argue with the manufacturers. This is lost time.

"Remember, you must get your customer to come to your method of doing business rather than your accepting his. The company you represent will think more of a few sales made in a businesslike manner than they will of a large number of sales made carelessly, where lack of judgment on the part of the salesman plainly shows in his orders.

"Don't brag in public places of what a wonderful business you are doing. A competitor may hear you and take advantage of the 'near sales' you consider sales, and you lose. The keen salesman does not have to spend his time telling his friends what a wonderful success he is making. This will be found out and recognized by the company you represent, which is better evidence of your prosperity than telling it yourself to your friends."

* Vice-President and General Sales Manager, Larrabee-Deyo Motor Truck Co.

The Retailing of Motor Trucks

By J. PIERCE GUYER*

TO market a motor truck to best advantage it is necessary that all of the salesmen average well. To attain this an equal distribution of territory or prospects is first necessary. We all like to help those that help themselves most, but to balance our sales average we should help most the men that need assistance and then, if they do not respond, use the survival-of-the-fittest law. It is easier for the sales manager to sell the trucks himself or to develop a star salesman, but reasoning dictates that the more substantial foundation policy is to sell through a balanced sales organization.

Analysis shows that the most successful sales organizations pick out experienced men who have good selling records behind them, men who average about thirty-five years of age and are married. This class of men know how to lay out, follow and close sales. Analysis and experience shows that less than 5 per cent. of the successful truck salesmen developed from the pleasure car end of the automobile business, it therefore follows you must look to other business lines for men. It goes without saying that the personal make-up of the applicant must be good, as you yourself would not care to do business with any one who is offensive in any way. Physical fitness and clean living are absolutely necessary. Keep in mind the fact that sales work is 75 per cent. physical energy and 25 per cent. mental energy. Don't misunderstand the difference between sales work and selling. Selling calls for 100 per cent. mentality.

Analysis of several good sales organizations in a city of 2,000,000 shows the average number of salesmen to be seven, that is in the city proper, and an average of three men for suburban or outside work, bringing the total average up to ten salesmen.

There are two extreme conditions, too many salesmen and too few salesmen to cover a given territory. Too many salesmen will create waste effort. Each salesman should be confined to a given circle of prospects. Remember, that these prospects don't buy trucks every day; on the average not oftener than once in three to five years. Having too few salesmen has the effect of spoiling concentrated effort and encourages hit-or-miss methods.

What to Teach Truck Salesmen

Salesmen should be taught your selling policies, the story that sells your trucks, mechanical conditions that are on the surface performance of truck, cost of operation, benefits the merchant derives from the use of your truck, specifications of your competitors' trucks, etc., and what is more important, the art of selling through the use of mentality.

Direction of salesmen in laying out work and concentration on prospects is most important. Few salesmen know how to plan their work and how close to follow prospects. If a prospect is not in the market or does not have the proper conditions or money to purchase your truck unit, further work is wasted effort. On the other hand, when a prospective condition is right for your truck unit, the sale should be completed at once; delay in closing loses your sale. Two or three calls a day are not too many when you find you are overcoming your prospect's objections.

Entirely too much time is lost in the development of prospects, thereby resulting in a loss of sales, as there is no time left for the actual selling. Better spend your time in securing prospects that have proper buying conditions and are in the immediate market. Keep foremost in your mind that the salesman's stock in trade is his knowledge and his time. The salesman who does not use his knowledge and time to best advantage daily is surely wasting his only assets.

When you have secured a prospect where the conditions are right for the purchase of your truck you must concentrate to bring your sales to a close. This should be done with the least possible lapse of time.

Delay the closing and your sale gets harder to close and finally impossible.

Build your selling story on truths and facts and stick to it. During every bit of your sales work drive home this story.

Two to three good reasons why a merchant should buy your particular truck are enough to sell it if they are handed to Mr. Prospect straight from the shoulder, several times during each interview.

Your best selling points are those features that are on the surface of your truck and especially those features that your competitor does not have. Don't attempt to use anything technical that would call for lengthy explanation to the prospect.

Avoid commonplace selling reasons, such as "this truck does the work of two to three teams," advertising value, etc.; these reasons for buying apply to your competitors' truck also and are only incidental.

The salesman should follow his customers closely and he will then be in a position to keep his truck well sold. Salesmen, however, should not get into service problems. They should always listen to troubles or kicks in reference to bills and then refer the customer to the proper service man and at the same time advise the company in reference to them. If your truck is sold honestly there will be no trouble keeping it sold and don't forget that your customer can furnish you with the best kind of assistance possible to secure in selling your truck. His recommendation will very often make or spoil your sales and he also can co-operate with you in securing prospects or prospective information. Help him and treat him right and both parties will gain.

*Vice President and Sales Manager, Rush Motor Truck Co.

Analyzing the Truck Prospect

By FORREST J. ALVIN, General Sales Manager United States Motor Truck Company

My personal attitude toward a motor truck prospect—and the one I endeavor to reflect among the men who sell our product—is that it takes all kinds of people to make up the motor truck buying forces. It is well to realize that fact, for then it is possible to adapt the arguments to suit the individual purchaser. The idea is to study the prospect; in other words, to get his point of view.

However, while I believe it is important to study the prospect and then use the arguments which are most likely to appeal to him, it is also a fact that in this advanced stage of the motor truck certain changes, due to education, have taken place in the mental attitude of the prospect. And for that reason the arguments which formerly had to be pounded home to nearly every buyer before he was convinced, assuming that he could be convinced, are not used so much now. Some of them scarcely ever have to be used.

The motor truck has passed through an evolution, and so have the men who use trucks. Five or six years ago the big selling argument had to be built around reliability, simply because so many prospects had doubts on that score. It was necessary also to talk endurance, and for the same reason. Those were the days when business houses and merchants had to be "sold" on the whole motor truck idea rather than on any particular make of truck. They knew what their horses would do, and they were not so certain about the trucks. Like any great forward step in commerce the truck business met with opposition, because it involved a change in the established order of one branch of business, namely, the transportation system.

Today it is no longer necessary to argue with prospects on the motor truck idea. All about them they see their competitors adopting trucks, and in general, they know that motor delivery is one of the greatest money-saving, time-saving, trade increasing items in their business. Merchants and business houses today, with rare exceptions, are all using trucks or on the point of doing so. And those that are truck users are increasing their fleets as fast as business permits.

What, then, is the big idea in appealing to prospects? It is, in my opinion, to sell your truck in competition with others, for with the prospect the thought uppermost is which truck he will buy, not whether he will buy a truck. He wants to know if your truck is reliable, how many miles it can run on a gallon, how easy it is on tires, who are the users, what they say about the truck. Yes, he wants to know about that truck, and I have found that he

does not care to be told about it in deeply technical language.

Of course, as I have hinted previously, it is still possible to discover men who wonder whether motor trucks are reliable, and whether they (these prospects) can afford trucks, and other questions which were asked a decade ago. However, these questions are asked so seldom that one is safe in taking for granted that the prospect knows the answer, and is interested in the modern questions of "which truck" and "what capacity truck" he wants for his business.

Purchasers of motor trucks are most interested nowadays from a business standpoint in knowing that the manufacturing company is reliable, that it has financial strength, that it has been in business a number of years, and that its production has been giving satisfaction. They want to know that the manufacturing concern is a permanent one, and that it will be in business in the future.

I find the average business is interested in this information more than in anything else. Selling motor trucks is a business proposition, and every business man is interested in good, sound, common-sense talk. If you meet him on that basis, real results will be accomplished.

We make it a practice when a man buys one of our trucks to consider him a member of our company's family and that his interests are our interests for evermore. There is too great a tendency to forget the purchaser the minute the sale has been made. Our interest is greater even after the sale than before. In this way we not only make a friend of every customer through unexcelled service, but he makes friends for us, and this is a mighty good policy.

Good Truck Salesmen Are Scarce

By W. F. WOOD*

MY experience as a director of motor truck salesmen has proved to me that there are more men who should be classed as order takers than as salesmen. Unfortunately quite a number of so-called motor truck salesmen in the southwest are either men who have come up from mechanical fields or who have failed as pleasure car salesmen. It seems that both of these classes have a mistaken idea that the selling of motor trucks is still a "game."

During many years experience as a salesman I have never endeavored to sell any article that demanded as diversified a knowledge as the selling of motor trucks, because experience has taught me that a successful motor truck salesman must be a trackless transportation engineer with all that such a title implies. He must be able to analyze the delivery or transportation problems of his prospect intelligently and back up his recommendation of the proper units required in a convincing manner. If he is unable to do this or does it in an unintelligent manner, he is robbing the prospect of his money. Such men I realize are scarce and as a result good material must first be secured and then educated.

A good salesman can sell a concern an order of trucks, but if the trucks do not give efficient service the salesman automatically is classed as a "barn stormer" and makes one night stands only. This, in a good many cases, is not the fault of the salesman, but of the manufacturer of the truck which he is selling. The Pacific coast possesses peculiar conditions from a trucking standpoint. The state of California alone has more than ten thousand miles of paved highways and streets over which most any truck that will hold together will operate for a reasonable length of time, while, on the other hand, we have mountain grades as steep as 30 per cent., which trucks must negotiate, and thousands of miles of desert through which no roads are built and yet motor trucks, with their burdensome loads, must plow through their hot sands often near axle heat. It can, therefore, be seen that the boulevard truck has its limitations, while again the truck powered and geared for mountain or desert work, would be slow and cumbersome when competing with trucks of the boulevard type. Such being a fact, the most successful truck for the Pacific coast must be one particularly designed to best meet all of these particular requirements and yet be a flexible unit.

Every factory manufacturing a standard article builds to meet the requirements of the greatest majority of its trade and in cases where this majority goes to the Eastern and Central States that factory is turning out a truck that cannot possibly compete with the trucks produced by the factory whose majority calls for trucks suitable for heavy and strenuous work of the mountain and desert, and the salesman who is selling the former truck is therefore unable to successfully compete in a territory with the salesman who is selling a truck that meets the needs of that territory, although the unsuccessful salesman may in reality be a better salesman than the one whose records he is trying to at least equal.

In doubling our sales last year over the preceding years, I give more credit to the management and the engineering department of our factory that made it possible for the sales force to make the records that they did.

The day is past when the gullible man buys a truck, for in many cases the man who is parting with his money really knows more about trucks than the man who is taking his order.

The greatest curse of the motor truck business today is trading. The man who insists on trading-in his old truck is demanding that you pay the price for "his mistake," regardless of whether the truck that he wants to trade is too large or too small, or whether it is of an inferior make. The fact remains that it is "his mistake." He demands at least twice and frequently three and four times the value of "his mistake" as a trade-in allowance, and competitors are usually ready and anxious to accommodate the buyer by sacrificing very often their entire profit in the sales. This is a game that no truck seller can buck successfully and is the reason that the business life of the average truck dealer seldom exceeds one year.

At the beginning of 1916 we boldly "took the bull by the horns" and discontinued trading, fearful at the start that it would seriously curtail our sales, but our increase last year certainly proves that trucks can be sold on a commercial basis and on established terms, and the average truck buyer is beginning to realize the fact that it behooves him to be suspicious of the man who will offer him three or four times the market value of a worn-out piece of machinery, if for no other reason than that such a man will soon be out of business and the truck which he sold will be without a local home for service and repairs.

Each year shows a marked advance in motor truck selling principles and I believe that I am safe in predicting that the time is almost at hand when the truck seller who offers the buyer any proposition other than a sane, commercial one, will be unable to secure any business. The day of the motor truck "game" is past and the industry from a selling standpoint is taking its place in the commercial world. The "barn stormers" and the "fly-by-night" artists have gone back to the positions in life to which their limited and dwarfed ideas of commercialism fit them.

* General Sales Manager, Moreland Motor Truck Co.

SELECTING AND TRAINING SALESMEN

By W. Z. BUSH, Sales Manager Corbitt Motor Truck Co.

IN selecting our salesmen we endeavor to employ only men of integrity. Thereafter we try to make them feel that they are a part of the organization, letting them know what is going on at the plant at all times, following up all their inquiries promptly and co-operating with them in every way.

We find that we obtain the best results in locating prospective buyers by circular letters and also through the satisfied owners of our truck, and also by having our representatives maintain friendly terms with the truck drivers, as we are furnished with quite a few valuable inquiries from this source.

We endeavor to instill in our salesmen the idea of not talking too much, but to consider the buyer and give him an opportunity of expressing his views and at the psychological moment secure his signature to the order. We have met with the greatest success with our prospective buyers by sending a salesman to enlighten them on the merits of our truck. It is somewhat more expensive than a catalogue or a follow-up letter, but the salesman has the advantage of being on the ground to answer any question that may arise pertaining to trucks; even though he may not secure the order at once, it shows the buyer we are interested in him, gives the salesman an

opportunity to meet him, and he is in better position when the prospect is ready to close.

We find that one of the greatest difficulties yet to be overcome is the unscrupulous salesman, through misrepresentation and by knocking the other manufacturers' products, thereby securing business by selling a truck too light for the given work and knowing that perhaps he will never return to that section again and so "get away with it." He is what is generally known as the "one-time salesman."

Truck Salesmanship

By A. W. CLARKE *

THERE have been so many rules, axioms, articles and even books written on the requisites of successful salesmanship that I believe we are all familiar with what is necessary in the salesman to produce results. It is my firm belief, furthermore, that the majority of men in the selling end of any business know and realize the essentials of selling success.

Of course, most companies disposing of their product through the personal salesman channel, get in their employ at times the "order taker," the "bally-hoo artist" and the "traveling man." But when I speak of a salesman I do so in the strictest sense of the definition of such—he is the man who is honest, trustworthy, knows the strong and weak points of his competitors' and his own product, and has the other requisites of which we are all familiar.

It is to such a man that we look for the disposal of our product. Granting that we have found him and knowing by a record of his past that he has been a success either in our own or some other line, what should we—the producer—do for him, let him spend a day, two days, or a week at the factory, familiarizing himself with our product—give him a set of prices, photographs or samples, a slap on the back, a good-luck handshake—send him out to "represent" us and then forget him—unless the orders don't come in?

Maybe that can be done in some lines of business, but not in the motor truck industry. My idea is that when our salesman leaves the factory for his initial trip—that is the moment the real work of the sales manager should start. Every day the salesman is in our employ, he should be under a course of training. Why? Because the sales manager is a clearing house of information, data and ideas gathered from his factory, his competitors, his men. Why then stop training our salesmen just because they are a hundred or two miles from us? The personal contact, as often as is possible between executive and employe, I believe is the greatest asset to productive results.

In our own business I believe the greatest obstacle we have to overcome is the question of price. It proves a stumbling block and a handicap to the best of salesmen. This is because of the prevalence of the motor truck buyer who makes his decision on price without a comparison of actual quality. This is due, to a great extent, to the fact that many manufacturers have made price their talking point, and the usual salesman knows about price (and sometimes not much more than that) and accordingly talks price and practically nothing else.

It is also due to the fact that the truck buyer, himself, has been somewhat weak on the knowledge of what goes to make up a good truck, and on account of that weakness the truck buyer has been more inclined to ask "what is the price?" and to weigh that element in comparison with other prices, because in that particular phase of the truck problem he could talk with less difficulty and with more of a feeling of confidence.

This consideration of price without full consideration of its ratio to quality, has been a natural fault with the motor truck industry. It is just one of those faults that come with any new industry.

But the truck buyer of today is becoming wiser. He has been stung by some "fly-by-night stuff," and has observed actual performances. Consequently, the truck buyer of today is able to judge better by specifications than he previously could.

The survival of the fittest in the truck industry will come about through a greater knowledge on the part of the truck buyer of actual truck value—that is, value as it means relationship between price and quality.

The COMMERCIAL CAR JOURNAL and other similar mediums are familiarizing the truck buyer more and more with the actual facts of truck construction. But the best factor toward the education of the buyer is the experience he is getting in the actual truck operations which come under his personal observation. An evolution is now under way which will more than ever prompt the truck buyer to purchase—not on a mere superficial comparison of prices—but on a consideration of prices in relationship to a real analysis of specifications and performances.

* General Sales Manager, Atterbury Motor Car Co.

Requirements of Truck Salesmen

By R. W. WALKER *

IN most cases selling an automobile is selling a luxury. The sales appeal is therefore directed along these lines. Selling commercial vehicles in all instances is selling a business necessity, therefore the selling endeavor must be worked out on business terms.

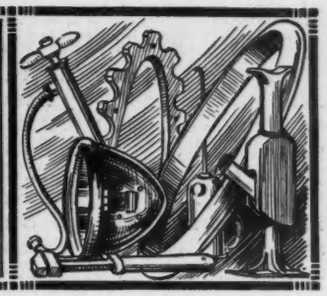
The European war has developed the motor truck industry to such an extent that it is now almost as highly competitive as the pleasure car business itself. The same old evils which attached themselves to the pleasure car business in the beginning have been temporarily transferred to the motor truck industry. These are price-cutting and trade-ins. The average business man who is buying a motor truck is just as keenly interested in it as an investment as he is in purchasing any other piece of machinery in his business, but if his mind has been thoroughly satisfied on this point he sometimes reverts to his usual custom in buying a pleasure car and tries to obtain a reduction in price, and in some cases endeavors to trade in a worthless and worn-out motor truck. These two items are the worst features in motor truck distribution today.

Salesmanship has developed to a very great extent in the motor truck business. A man selling a motor truck worth $3000 or $4000 must be mentally equipped to talk to the heads of business houses. Other purchases are left to minor officials, but in most cases the motor truck must be finally purchased by the head of the concern, brought into its field many men who are therefore the commercial business has good business men as well as expert salesmen. The training of young men into this field is becoming more of a necessity each day. It is difficult to put men out into the field eight and ten hours a day and to absolutely control their time and energy. The first thing a salesman must learn is to govern his own time and to regulate it to the best advantage. Some salesmen make a great many calls and waste more time in making these calls when a good salesman can make fewer calls with greater results. This is simply concentration under competent direction.

The old type of whirlwind salesman who shot his prospective customer a number of funny epigrams has disappeared. The motor truck salesman of today is a man who can present his proposition in the most concise and businesslike manner. Motor truck selling is hard work and it needs salesmen who are not only able to cover a great amount of territory physically, but mentally as well. Many large motor truck companies have already established schools for the training of salesmen. In this way a man can be given from six months to one year's time in courses throughout the factory. Four years from now motor truck selling will be developed to a highly specialized art.

* General Sales Manager, Hurlburt Motor Truck Co.

TRUCK ACCESSORIES AND APPLIANCES



THE ODELL TRUCK-FORMING ATTACHMENT FOR FORDS

The Odell attachment makes a complete one-ton truck when installed on a Ford chassis. The retail price is $350 f.o.b. Atlanta. The attachment forms practically the rear half of the motor truck. The frame is 14 ft. long, and when attached to a Ford chassis gives a body space of 8 ft., 10 in. back of the driver's seat. The method of attaching makes the Ford frame a subframe and gives the combined frame much more strength and solidity than the original chassis of the car.

This attachment takes advantage of the Ford good qualities and adds to them a truck attachment that will carry "dead weight" loads of one ton and over. The frame, of 4-in. channel steel, telescopes and reinforces the Ford frame. The two frames are bolted directly together at the front and at the side, and at the rear the Ford frame is riveted to a steel cross member on the attachment frame, insuring great strength and rigidity. The new frame is supported in the rear by carefully designed springs resting on a solid 2¼ x 1⅝-in. axle, equipped with roller bearings and heavy truck wheels with standard make solid rubber tires. There is a heavy relief or bumper cross spring over the rear axle to take care of overloading.

The Odell unit is so designed that practically 90 per cent. of the load is carried by the rear axle and only 10 per cent. on the Ford front axle and wheel. The rear axle assembly of a Ford is converted into a jack shaft and is rigidly attached to the frame by especially designed hangers. The Ford wheels are replaced with heavy sprockets which transmit the power to the rear wheel by heavy-duty chains. Emergency brakes, ample to handle loads on heavy grades, are provided on the rear wheels. The attachment is produced by the Odell One-Ton Truck Attachment Co., Atlanta, Ga.

Specifications.

Carrying capacity—2000 lbs.

Frame—Length 168 in., width 32 in., with 4-in. channel rolled steel.

Axle—Special axle steel, 2¼ x 1⅝-in. roller bearing.

Wheels—Heavy truck type, 12-spoke, 32 x 3½ in.

Tires—Solid rubber, 32 x 3½ in., pressed-on type.

Loading space of 9 ft. or more behind the driver's seat.

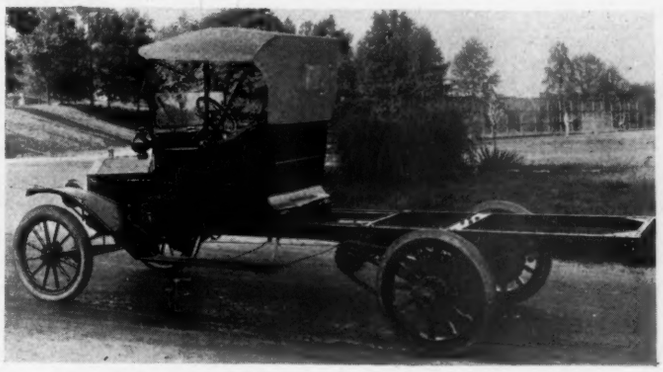
Gear ratios on sprockets—20-tooth on jack shaft and 42-tooth on rear wheels.

Driven by roller chains, heavy truck type, ¾-in. diameter roller, ⅝ in. wide, 1¼ in. pitch.

Brakes—Emergency on rear wheels, expanding type, in drums operated by hand lever. 1-in. drum, 2½-in. shoe, lined with high-class material.

Tread—56 in. front, center to center.

Weight of attachment—1000 lb.; with Ford complete, 2000 lb.



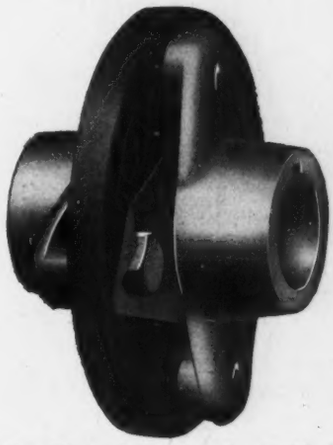
The Odell One-Ton Truck Attachment

Converts a Ford chassis into a one-ton truck with truck axle, bearings, wheels, tires, and a truck frame.

BLAIR MAGNETO COUPLING

The Flexite magneto coupling, manufactured by F. R. Blair & Co., Inc., 50 Church Street, New York City, has been developed to meet the demand for standard fixed and and adjustable couplings that will satisfactorily fill the requirements of interchangeability, flexibility, concentricity and in the adjustable type, absolute adjustment with positive and permanent setting at any point. These Flexite magneto couplings are made in but one size which is small enough to meet very close requirements as to space, but strong enough for the work put on them. The only variation is in the bores. Standard DU-4 tapers and 4-8 and ¾ in. straight bores are carried in stock. Other bores will be furnished on order.

The drive is through a Flexite disc, 2¾ in. diameter and ¼ in. thick. This material has ample strength, is moulded concentric and will not warp. Referring to the unassembled view, A is a thimble, keyed, and if desired, pinned to the driving shaft; B is the adjusting spider fitting over A and centered upon it. C is a Loxon seating ring having short, sharp, rugged teeth on each side which bite into B and the flange of A when the two are drawn together by the nut D, and securely lock them against turning upon one another. E and F are the seating ring and soft washer respectively of the Loxon, used to lock D permanently in place.



The Blair Coupling Assembled

The spiders are carefully bored, drilled and tapped with reference to concentricity. The holes in the discs are located by pins in the mould, and are made without clearance so that concentricity is assured in assembling and there is very slight possibility of the driving bolts shifting in them.

The adjustment may be as fine as the hand of the adjuster can work and when once set the coupling is easy and permanently locked in position by an application of the Loxon principle. When once an adjustment has been made the magneto may be removed without affecting it, by simply removing the driving bolts and lifting out the disc.

CHICAGO PNEUMATIC TOOL CO., maker of Little Giant trucks, Chicago, Ill., has been granted a Grand Prize by the Panama-California International Exposition.

THE GOLIATH COMMERCIAL CAR EQUIPMENT

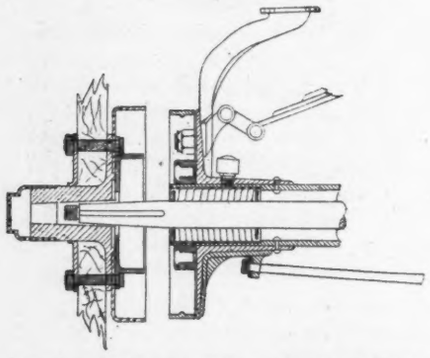
The making of a motor truck from a Ford pleasure car at very low cost for the installment of equipment, or additional parts, is said to have been attained by the Goliath Commercial Car Co., Chicago, Ill.

The equipment, complete, consists of: First, truss rods, two axle clamps, screws and nuts. Second, two spring hangers, that fasten to the inside of the brake housing with spring pads, clips, ties and nuts for same, two side springs, 44 in. long, 2 in. wide, and seven leaves with body hangers, ears and bolts. Third, two high duty bearings, two housings for them that fasten by use of the present bolts through the spokes of the wheel and bolts and nuts for them.

The price for the units is $65 and the units can be divided, the first and second costing $40, with the third, separately, $25. As the load of 2000 lb. can be carried on these high duty bearings it is possible to equip the car with solid rubber tires and with the side spring construction it is also possible to equip with a delivery body of a length 60 in. back of the driver's seat.

Where it is desired to use a longer body than 60 in. back of the driver's seat, the chassis should be lengthened and this requires a special frame to give longer wheelbase, a propeller shaft, a housing for the propeller shaft, two flanges to hold each end of the housing and a cross member to hold the universal joint as extended.

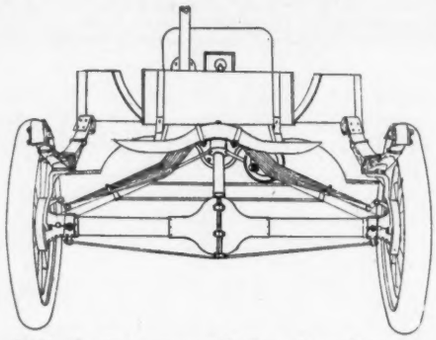
In the Goliath attachment nothing is changed on the Ford car and the only tool



Section View of Axle and Wheel Hub

necessary to change the car to a truck is an adjustable wrench. In the original construction inside of the rear brake housings are expanding bands and cams, or in other words, the emergency brake mechanism. This leaves quite a vast amount of room inside of the brake housings and in this available room has been fitted a secondary housing, using the same bolts to pass through the outside flanges of the wheels to the spokes, fastening this secondary housing securely to the inside of the wheel hub and the emergency brake housing. This leaves a vacant space of about ¾ in. wide and 5 in. diameter. Adjusted to this space is a high duty bearing which fits around the inside projection of the Ford rear axle, this bearing, in turn, resting in the secondary housing previously mentioned, as being held in place by the bolts passing through the rear wheel hub flange and spokes.

The regular construction of a Ford rear axle, its housing, the Hyatt bearings, the sleeve and necessarily the spindle of the axle, project through the previously mentioned emergency brake housing to the extent of ¾ in. It is this projection which forms the outer housing of the rear Ford axle which rests inside of the Goliath high duty bearing, which necessarily carries the



Goliath Commercial Car Attachment
Showing the two truss rods and the auxiliary springs

entire weight and capacity of the rear construction, making it one of the semi-floating types.

With the Goliath installation the Ford car is equipped with practically two axles—the Ford rear axle transmitting the power and the Goliath auxiliary carrying the load.

The end of the Ford rear axle housing where it projects on the inside of the emergency brake housing, is capped by metal and a felt washer to retain lubrication for the Goliath high duty bearing. With the Goliath equipment the metal cap is removed and felt packing substituted for the ends, which prevents escape of lubrication and at the same time also provides to avoid friction for both the Goliath and Hyatt bearings.

The Goliath Co. are also building 1-ton form-a-truck attachments with chain and sprockets for $350 and worm-driven attachments, 1½-ton, for $395.

HUDSON UNIVERSAL-JOINTED VALVE GRINDER

A valve grinding tool, the working end of which is allowed a certain amount of motion in any direction relative to the shank, is being placed on the market by the Hudson Motor Specialties Co., Philadelphia, Pa. The advantage over a rigid tool is that, regardless of the exact position in which the shank is held, while it is being revolved between the palms of the operator, the valve will not be ground more on one side but uniformly. The universal jointed end also makes it easier to grind valves of the fourth cylinder of a Ford engine, which ordinarily are difficult of access with the solid type of grinder.

The construction of the tool is quite plainly brought out in the illustration, the upper view of which shows the complete tool and the lower views enlarged details of the parts making up the universal joint. This universal joint effect is secured very simply by pinning the tool head to the shank with a pin which is much smaller than the hole through the shank. The coiled spring, which goes between the head and the shoulder of the shank, takes up the looseness and holds the head normally square with the shank.

The head is a die casting, split as shown, so as to clamp either the screw driver end or the two pins, according to the kind of valve head which is to be ground and the pins are adjustable in their distance apart as indicated. The pins, the screw driver blade and the spring are tempered steel and the shank mild steel, knurled on the handle and provided with a flange to guide the bottom of the hands. The grinder will retail at $1.

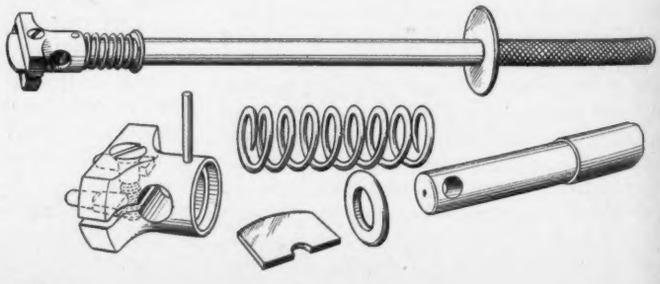
FERRY SCREW MACHINE PRODUCTS

The Ferry Cap & Set Screw Co., Cleveland, Ohio, is offering an extensive line of screws and screw machine products, including cap and set screws, drilled studs, taper pins and specialties. In its catalog, besides illustrating and describing its products, this concern also publishes a description of standard threads in general which should prove very useful to the trade. A tabular price and specification list accompanies each product illustrated in this booklet.

THE MIFFLINBURG AMBULANCE BODY

The Mifflinburg Buggy Co. is producing an ambulance body with a drop sash at the driver's seat and with rear side panels and rear doors. The panels are of steel. This body can be furnished with a cot and collapsible seats at an additional charge, if desired.

The inside dimensions are 7 ft. 6 in. long, behind the seat; 3 ft. 8 in. wide, and 4 ft. 8 in. high. The top does not knock down for shipment and the weight is approximately 600 lb. before being packed for shipment. The body can be ordered as No. 301 from the Mifflinburg Buggy Co., Mifflinburg, Pa.



The Hudson Universal-Jointed Valve Grinder

NEW METAL FOR BRONZE CASTINGS

The McGill Metal Co., Valparaiso, Ind., is producing a new bronze metal alloy. It contains from 85 to 90 per cent. of copper, has a bright golden color, is resilient, sonorous and possesses most of the characteristics and properties of bronze. The tensile strength is 75,000 lb. per sq. in., the elastic limit 30,000 lb., the elongations 18 to 23 per cent. on a 2 in. test length and the reduction of area 17 to 24 per cent. Its fine grain, combined with its hardness and toughness, and its susceptibility to a high polish, renders the McGill metal particularly suitable for bearings and bushings or other machine parts such as gears, cams, valves, etc. The metal can be easily machined and its hardness and resiliency regulated when preparing, to suit different purposes.

Several McGill Metal Castings

THE MASTER UNIT FOR FORD CARS

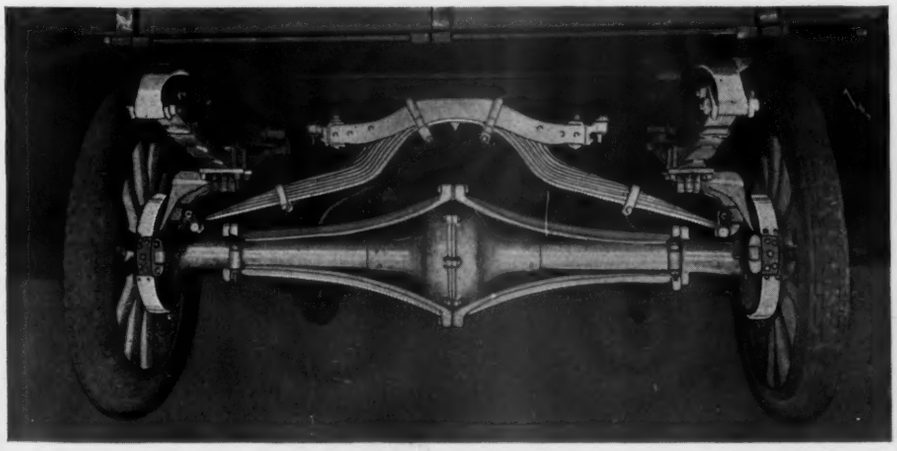
Rear end reinforcements, to enable a Ford with special body to serve as a delivery car with guaranteed capacity of 1 ton, have been worked out to a point of efficiency in lightness, strength and low price in the Master unit.

The elements of the Master unit are: Master floating rear axles, auxiliary side springs, Master housing braces and Master brakes. Under the construction employing the Master rear axle bearing assembly and housing braces, the axle is relieved of weight carrying functions, which are transferred to the housing, leaving the axle free to bear only the stresses of driving the car. Incidentally the differential is claimed to be relieved of all strain due to action of the transmission brake, by use of the heavy duty Master brake, which is supplied as a part of the Master unit. The strength of the radius rods and the housing is doubled by the Master radius and housing braces.

A level position of the body is maintained at all times by the triple platform spring suspension, formed by the semi-elliptic side springs in connection with the Ford cross spring.

The Master brake, which forms part of this unit, is the rear end hub-drum, external contracting brake, which has become well established in service on delivery cars. In the Master unit its function is the same as elsewhere when used alone, to relieve the wear and tear on the driving pinion and Master gear and take the twisting strain from the axles and driveshaft which is normally present in the use of the ordinary service brakes on the transmission.

The price of the Master unit is $125 f.o.b. Los Angeles. Master Equipment Co., Inc., 2201 South Main Street, Los Angeles, Cal., is the producer of this unit.



The Master Attachment Set Up on a Ford
Showing the auxiliary side springs and the two Master housing braces

PARRY BODY No. 418

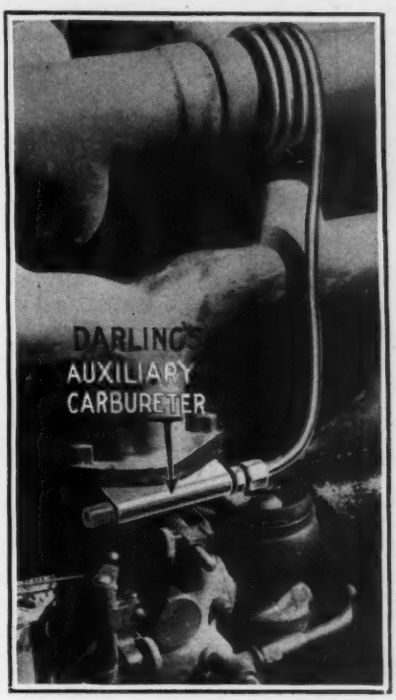
The Parry Mfg. Co., Indianapolis, Ind., is now producing its new model, No. 418 body, which has just been put on the market to take the place of No. 218, which was described in the January, 1917, issue, page 88.

Following are some of the principal features. It has 60-in. loading space behind the seat without adding any weight to the body. The deck has been improved, it now having a rounded-front made in one solid piece bent to proper shape. There is no obstruction in front to prevent raising the hood. The door on the right hand side is fastened with pin hinges, and can be taken off. On the left side the upper front panel can be taken out, leaving a body with a fore door. The windshield is hinged and can be swung either in or out. The side windows are also hinged and can be raised up against the roof. The body is also substantially ironed.

DARLING AUXILIARY CARBURETOR AND ELECTRIC VAPORIZER

Len H. Darling, 211 W. P. Story Bldg., Los Angeles, Cal., is producing an auxiliary carburetor of gasket formation which fits in between the carburetor and the intake manifold, without drilling any holes in the manifold. An annular ring perforated with small holes injects steam into the gas mixture, the amount being controlled by an automatic valve. The steam is furnished by the water vapor from the radiator overflow, which is heated around the exhaust pipe. The price of this accessory is $6.50 complete.

Another of Mr. Darling's products is an electric vaporizer. This is an electric resistance coil, which heats the mixture in the manifold and is used to make cold weather starting easy. On the Pacific coast this device is used for starting on distillate, a heavy fuel which does not vaporize until the motor is hot. The price, complete, is $5, including the switch and wire necessary for installation. This device is installed in a short time and can be used on any car carrying a storage battery.



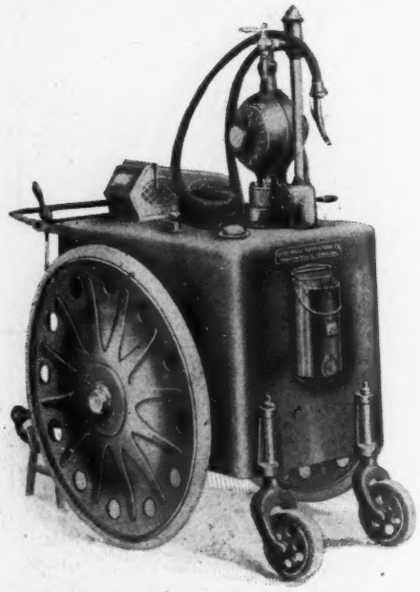
A View of Darling Electric Vaporizer

THE MOTOR TRUCK CLUB OF AMERICA recently gave merchants, car and truck dealers, and secretaries of trade associations a lesson in preparedness when a New York regiment was ordered to report somewhere in New York with all camp equipment and paraphernalia. The Motor Truck Club provided enough trucks on short notice to transport all the equipment. On Sunday morning, April 1st, 16 trucks of various makes and capacities, fully loaded, started on a 65-mile trip and all of them reached their destinations without any trouble by 8 p. m. The Motor Truck Club worked in conjunction with the commandant of the regiment. The Club is composed almost completely of truck owners.

THE SHOTWELL PORTABLE ANTI-SYPHONING GASOLINE TANKS

Early in January of this year the Shotwell Pump and Tank Co., Minneapolis, Minn., was incorporated to manufacture a complete line of pumps, tanks, etc., for the handling of inflammable liquids. The Shotwell method does away with the old style rack and pinion, substituting therefor a positive, accurate method which delivers an exactly measured volume of liquid. This volume can neither be increased nor decreased through negligence, design or mechanical wear and tear, it is claimed.

The design embodies a sliding block and cross head affording large wearing surfaces,



Shotwell Filling Station

This pump is operated in one direction, thus doing away with the reverse stroke and saving time. All working parts are enclosed and are dustproof.

insuring long life and making it possible to operate the pump constantly in one direction without having to reverse the stroke. This makes the Shotwell a very fast pump and allows for the use of a meter of such design as will guarantee accuracy, not having to contend with the reciprocating movement. Besides, this improved design makes possible the complete enclosure of the working mechanism of all types, thereby keeping out dirt which tends to rapidly cut and wear the working parts.

Another feature in the Shotwell method is the accessible foot valve. This valve is situated directly above the tank instead of inside of it, and is easily accessible at all times through a cast iron manhole box, with hinged top. By means of this valve it is easy to clean the valves and the intake screen.

LITTLE GIANT CONVERT-A-CAR TRUCK UNIT

With the Convert-A-Car one-ton truck unit a one-ton delivery truck can be made of any Ford by reversing the process of assembly. No parts of the Ford are cut or destroyed and the only extra equipment necessary is a pair of Ford rear hubs, on which to mount the sprockets. It does not in any way interfere with the Ford front fenders or running boards. The rear wheels are removed from the hubs and the sprockets applied in their place or a set of extra hubs are kept on hand, and the wheels removed from the axles with hubs in place, and the extra hubs and sprockets are applied. The Ford axle is then lifted into the hangers under the truck frame, which practically telescopes the Ford frame, thus converting the Ford frame into a sub-frame, its only duty being to carry the power plant.

None of the strain of the load is carried by the Ford frame, but all the load is on the channel. The Chicago Pneumatic Tool Co., 1615 Michigan Avenue, Chicago, Ill., manufacture this unit.

Specifications.

Axle—2 5-16 x 2 5-16 in., solid forged high grade carbon steel.

Bearings—Roller.

Brakes—12 x 12 in. internal expanding, lined with raybestos.

Springs—Semi-elliptic, 42 x 2¼ in., having shackle links at both ends. Auxiliary cross spring mounted on heavy structural steel; tee cross member arranged to bear on axle when loaded sufficiently.

Sprockets—Interchangeable cut steel to take standard makes of roller chains, 1 in. pitch, ⅝ x ⅝ in. roller.

Brake Drums—Diameter, 12 in. x ½ in., brake surface, bolted to rear hubs.

Radius Rods—Easily adjustable for proper chain tension and allowing free action to compensate for uneven road surface.

Drive—Double chain, 1 in. pitch, ⅝ x ⅝ in. roller, easily removed for cleaning.

Wheels—34 x 3½ in. heavy artillery, second growth hickory, twelve 2 x 2 in. rectangular spokes.

Tires—Pressed on or demountable, 34 x 3½ in., solid.

Speed—Between 12 and 20 m.p.h.

Load Distribution on Chassis—Approximately 50 per cent. on rear axle unloaded, and at full load approximately 90 per cent. on rear axle.

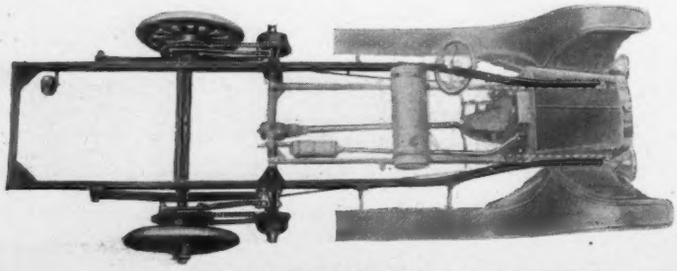
Loading Space—108 in. length of frame, in rear of cab top, 99 in.

Wheelbase—125 in.

Carrying Capacity—2800 lb.

Weight—Including Ford chassis and without body, 2100 lb.

Frame—4 in. 5¼ lb. structural steel channel, length 168 in., width 32 in.

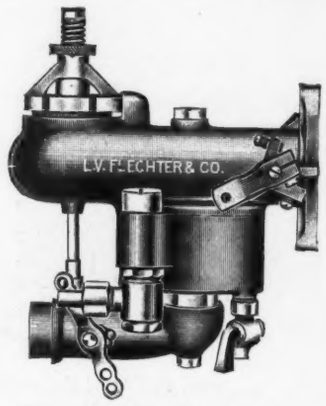


Plan View of the Little Giant Convert-a-Car

CARBURETOR WITH HOT-AIR ATTACHMENT

The Flechter carburetor, produced by the L. V. Flechter Co., 245 W. 55th Street, New York City, is of the fixed multiple jet, air valve type with hot air attachment and choke for easy starting, and is made in both horizontal and vertical outlet types.

The main jet is in the center of the venturi tube; the other, the auxiliary, is in the center of the auxiliary air passages. Once the proper jets have been determined, it is



The Flechter Carburetor

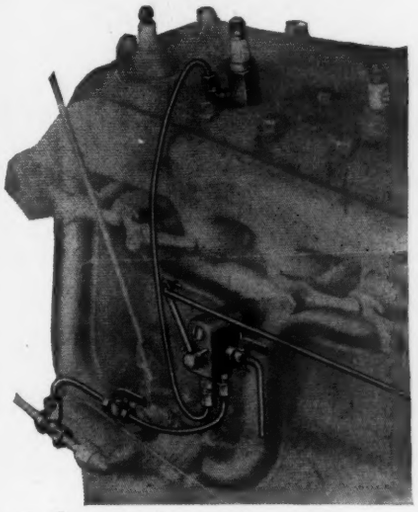
claimed, no further adjustment of the gasoline supply is necessary.

To compensate for the variation in engines the air supply is made adjustable through an auxiliary air valve. This valve has two adjustments, one for low speeds and one for high speeds, both on top of the carburetor and easily accessible. These are plainly marked so that no mistake can be made. Both work automatically and cannot be altered in adjustment by the vibration of the car. The natural tendency of most drivers is to blame engine troubles on the carburetor and when they cannot get the engine running right, with the adjustments provided by the manufacturers, they change the tension of the springs by pulling them out or cutting them off. In practically all cases where the springs have been pulled apart or cut off the only remedy is a new spring. The fuel is set to supply all the fuel necessary and as the valve mechanism is positive it cannot vary and should not be changed.

AN ATTRACTIVE WINDOW DISPLAY used by the Detroit branch of the Prest-O-Lite Co., Inc., created unusual attention. Aside from the show cards, which were done in red, white and blue, the display was made up entirely of Prest-O-Lite batteries, battery parts and accessories. Gotten up in the form of a military camp, a number of "tents" were built of battery plates and the camp protected by an "entanglement" of cell connectors. Prest-O-Lite batteries were arranged in the form of a fort, on which were mounted hydrometer "guns." The "guns" were manned by battery experts who were supplied with plenty of ammunition in the form of distilled water, testing apparatus, etc. An effective card, in keeping with the display, read, "Enlist now in our army of satisfied customers."

DUPLEX PRIMER AND DECARBONIZER

The Smith Duplex primer and decarbonizer, which is being distributed by Irving M. Shaw, 80 Fifth Avenue, New York City, is an automatic priming, easy starting and decarbonizing device that primes with a fine spray or mist which is taken into the cylinder in a highly explosive form. It utilizes the compression of the engine automatically while cranking, to force into the intake manifold a spray of gasoline and air, properly mixed. The device is simple, having no moving parts to get out of order and is controlled from the front of the radiator by a wire similar to the choke valve. With the engine running idle at a moderate speed, the device will convert water into steam and pass it through the cylinders, thus acting as a carbon remover. The price, complete, is $10.



The Smith Primer and Decarbonizer
Attached to a Ford engine

ESTA WATER AUXILIATOR

The Esta water auxiliator is an automatic fuel conditioning device, simple in construction and operation. The engine suction, causing a vacuum in the container, draws currents of air through the water in the device, humidifying the air with water vapor which is drawn into the intake manifold. It there combines with and vaporizes the gasoline, forming a damper mixture. The mixture is then introduced into the combustion chambers, where the water vapor is converted into steam on the ignition stroke, which is said to insure a powerful and sustained stroke, an additional supply of oxygen, complete combustion of the gasoline and an automatic elimination of carbon. In other words the Esta water auxiliator duplicates the conditions under which a motor works on a damp day.

The manufacturer also claims for the device an increased flexibility as a result of the rapid acceleration and greater power, and the elimination of the pitting of valves and lost compression. The control of the device is automatic.

This water auxiliator can be attached to any car in a short time. It is mounted on the dash, under the hood, as can be seen from the illustration, with four wood screws. The intake manifold is bored directly above the carburetor with a 11-32-in. drill and tapped with a ⅛-in. standard iron pipe tap, then the auxiliator is screwed in and the tubing attached.

Esta Water Auxiliator
Showing the position when installed on the manifold. This Auxiliator is claimed to be a fuel economizer, efficiency increaser, minimizer of carbon deposits, and producer of a more satisfactory working engine.

This device is manufactured by the Esta Water Auxiliator Co., 1916 Broadway, New York City. The price, complete, is $15.

ALLEN SOLDERING FLUXES

Automobile dealers and garage men will be interested in the line of soldering fluxes of which the L. B. Allen Co., Inc., N. Lincoln St., Chicago, Ill., is making a specialty. As a result of considerable experimental work in the laboratory a flux has been produced that in strength and purity is of an exceptionally high standard.

For building or repairing radiators, tanks and similar work, the Allen fluxes are said to have found great favor. They are claimed to have the strength to make the job stay solid. The flux is clean, easy to handle and rapid in its action. It can be had in the concentrated form or in just the strength needed for the job.

When used in splicing wires, this flux does not corrode and thus in time reduce the cross section, as it contains no acids. Allen fluxes are made in four forms: stick, paste, salts and liquid.

Samples can be had by addressing the L. B. Allen Co., Inc., N. Lincoln St., Chicago, Ill.

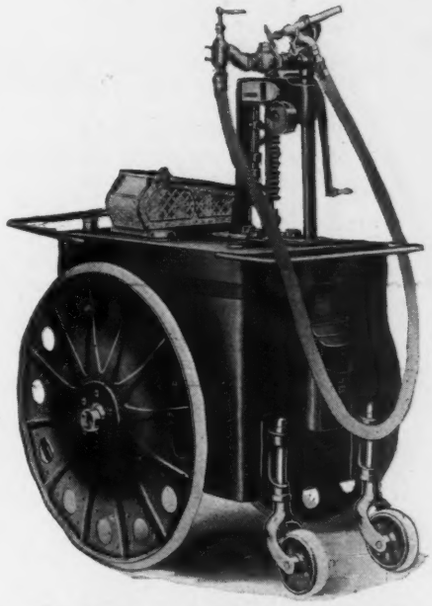
KARBON-KILL

The Distributors Motor Supply Co., of Cleveland, Ohio, is putting on the market an oil compound that is guaranteed to remove carbon and prevent its reaccumulation. Karbon-Kill may be applied directly to the cylinders through the pet-cocks whenever necessary as a remover, but application through the gasoline as a preventive is recommended. The price is 75 cents per bottle.

PORTABLE GASOLINE OUTFIT

The American No. 21 portable gasoline tank is for use in connection with long-distance gasoline storage outfits in public or commercial garages. The wheel tank can be filled from a stationary pump and moved about from one car to another and, by use of the hose and nozzle, the gasoline is discharged directly into the automobile tank without much exposure to the air. The tank is mounted with a double-acting continuous flow gallon-measuring pump which discharges on both the up and down strokes of the piston. Four and one-half turns of the handle discharge a gallon and quantity stops may be adjusted and set for pint, quart, ½-gallon and gallon. The equipment includes discharge register, spring lock, two keys, a 7 ft. length of hose and a portable anti-drip nozzle.

The meter automatically registers all gasoline pumped up to 100,000 gal. and then repeats. It is strongly constructed and can not be turned or manipulated to falsify its record. The tank is 3-16 in. steel, welded and seamless and has a capacity of about 50 gal. The handles and the brackets that support the small wheels are welded to the body of the tank. The tank is carried in a steel frame, the uprights of which are of heavy cast steel and to these are attached the axles for the large indestructible pressed steel wheels. The steel frame passes underneath the tank, supporting it, thus avoiding strain on the tank. The large wheels have solid rubber tires, while the small wheels have heavy fibre tires. The tank is 60 in. high, 32 in. wide and 342 in. long and weighs 500 lb. The shipping weight is 650 lb. It is made by the American Oil Pump & Tank Co., Cincinnati, Ohio.



The American Portable Gas Tank
Equipped with meter and autographic register, in addition to standard equipment

THE INTERNATIONAL HARVESTER MOTOR Co., New York City, has secured an order from the British Government for 150 5½-ton Mack chassis, of the Bull Dog type.

The K-E Auto Crawler

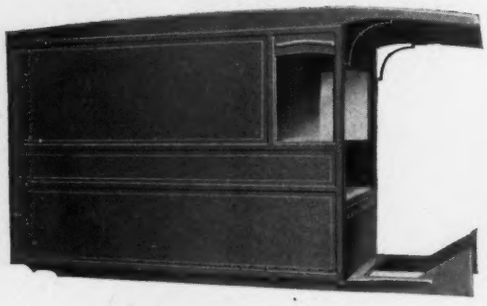
This accessory for garages is being produced by the Kund & Eiben Manufacturing Company, Pittsburgh, Pa. It is of hardwood construction throughout and is fitted with ball-bearing casters and a neatly upholstered head rest. It has a natural finish and is 22 x 36 in. The price is $2.

A First Aid Outfit

A practical first aid outfit, suitable for garage use. It consists of a strong steel case, 11½ x 5½ x 2¼ in., finished in black japan, baked on, and fitted with an instantaneous snap. The contents have been carefully selected to supply the needs in an emergency. All gauze, bandages and cotton have been prepared in aseptic laboratories. It is manufactured by the Patent Novelty Company, Fulton, Ill., and the price is $2.50.

The E & S Lifting Device

This arm was designed by Ellis-Smith Manufacturing Company, Incorporated, Buffalo, N. Y., to facilitate the use of jacks in handling cars having extremely low bumpers or low axles. It is made of malleable iron and steel, weighs thirty pounds, and has sliding forks used as frame rests, which make it adjustable to any width. When lifting, it slides under the frame or spring instead of the axle. The price is $7.

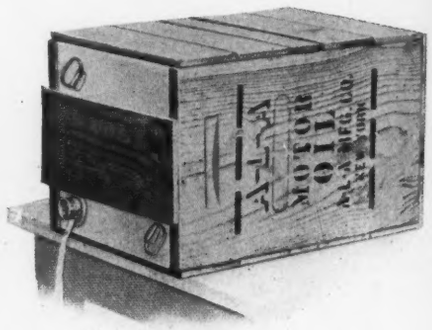


The Auburn Panel Body

With the exception of the top, it is built from wood, the framework being oak, framed together with lead, and the panels of soft yellow poplar. The size is 43 x 63 in. back of the seat, and it has double doors in the rear, with glass panels. The price, including floorboards cut for levers, is $75, and the producer is the Auburn Wagon Company, Martinsburg, W. Va.

The West Cast-Steel Wheel

This is one of the types of wheels manufactured by the West Steel Casting Company, Cleveland, Ohio. It is intended to meet the requirements of trucks from one and a half tons to the largest tractors and their trailers. The steel used is designed to give the best service in all kinds of weather.

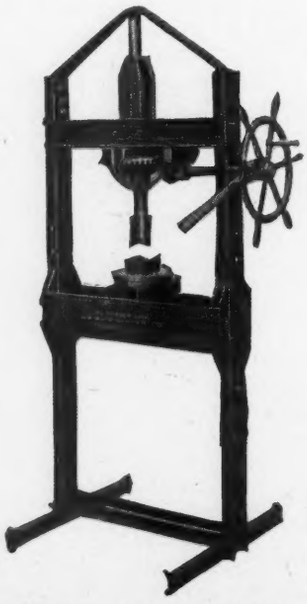


The Handy "Ten"

This can contains ten gallons of the various grades of oils and is made of metal covered with heavy wood, so the metal cannot be punctured. It is fitted with a patent faucet, so that it is not necessary to lift the can to pour out oil; simply lay it flat and turn the faucet. It can be refilled, and the price is $6.50. The A-L-A Manufacturing & Supply Company, 136 Liberty Street, New York City, produces this can.

Stevens Service Cabinet

This Cabinet Assembly No. 28 makes a very complete cabinet, particularly well suited to the requirements of accessory dealers and in garages. It contains eighty large drawers, which may be subdivided into smaller compartments if desired. The base section is provided with sliding doors and an inside shelf, and is roomy enough to carry a stock of larger and heavier parts, such as cylinders, crankshafts, transmissions, etc. The price is $56.70, and the maker is the Stevens Company, 375 Broadway, New York City.



McGregor's Garage Press

Attachments are furnished for all kinds of work for which such a press is intended. The press is of twenty tons capacity and the frame is of heavy channel steel. The height of the frame is 81 in. and the weight complete, when crated, is 450 lbs. The price is $52, and the maker is the U. S. Auto Bumper Company, Chicago, Ill.

The McGregor Lifting Crane

A very handy accessory for every garage, requiring but one man to operate it, is this one-ton crane, built by the U. S. Auto Bumper Company, 115 East 30th Street, Chicago, Ill. It is made throughout of channel and angle steel. The bed rests on four heavy casters. The lift is 7 ft., and the price is $56.

CHILTON TRACTOR JOURNAL

Reclaiming the Arizona Desert With Tractors and Irrigation

Soil Produces Cotton Equal to That of the Nile Valley, in Egypt, and is Suitable for Tire Fabric

By E. S. FOLJAMBE

FOR years the world has been scoured by automobile tire manufacturers for a long fibre cotton that would produce a sufficiently tough fabric for tire construction. The so-called Sea Island cotton and the famous Nile Valley cotton have always been supposed superior to anything else that could be grown. It has but recently been discovered, due to a series of experiments by the Government lasting over some twelve years, that the fertile but unproducing soil of the deserts of Arizona, when watered, will produce a cotton with a fibre of remarkable length, far superior to anything grown in the well-known cotton fields of the South and exceeding in quality and length of fibre the Nile Valley product.

The Government's experiments were carried on in the Indian reservation of Arizona and its findings are no longer considered experimental, but it is now known that long-fibre cotton, the best in the world, can be produced in the arid lands which for so many years have been fruitless for lack of water. The wonderful reclamation project by the Government culminating in the Roosevelt Dam, has already brought into cultivation 200,000 acres of former desert in the Salt River Valley, now without doubt one of the most fertile farming districts in the country.

The recent high price of cotton and especially of the long-fibre over-seas product, has resulted in a thorough investigation of the possibilities of a home production of the necessary cotton for tire fabric by several of the well-known tire companies. This article deals with the extended operations of the Goodyear Tire & Rubber Co. in the region about 14 miles south of Mesa, Ariz. This company has other tracts, one of 14,000 acres being southwest of Phoenix.

We are particularly interested in the work being done with Caterpillar tractors on the first-mentioned 9000-acre tract. On January 1, 1917, the Goodyear company undertook the Herculean task of changing the vast desert area into productive cotton fields.

To those unfamiliar, "desert" often means a sandy waste devoid of all vegetation, but this is far from the fact in Arizona, as the accompanying illustrations will show. The soil is covered with desert veg-

Horseman Directs Tractor and Men

The man in charge is directing the tractor operators and men attending the chains, from horseback

Tractor Headquarters and the Improvised Tent Repair Shop in the Field

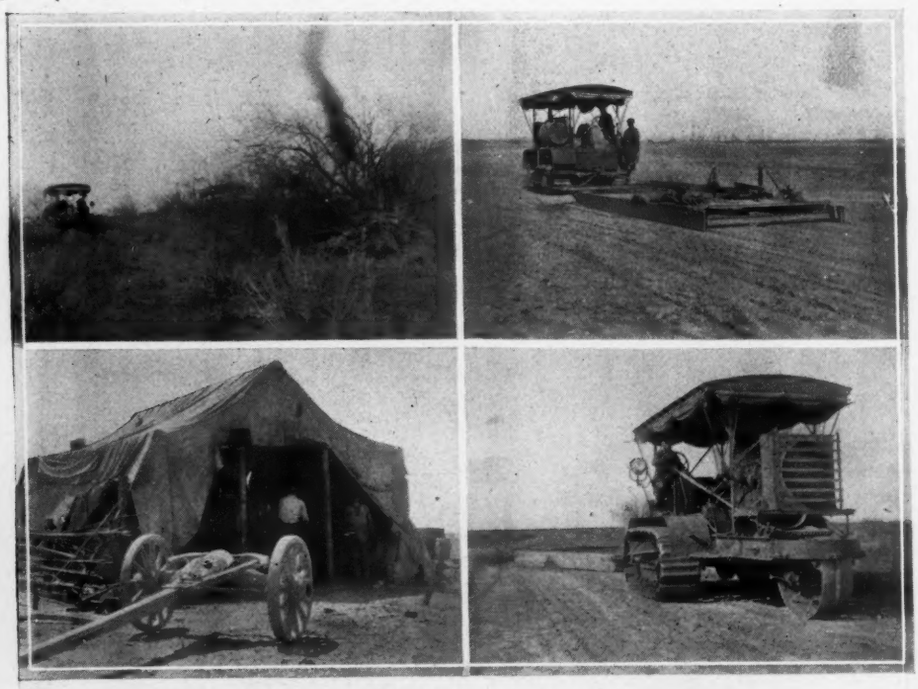
etation; bushes, some 5 ft. in height, familiarly known as grease-wood, Mesquite trees anywhere from 10 to 16 ft. high, Pala Verde trees of even greater size, to say nothing of innumerable small tough and scraggly bushes,—and last but not least, the weird and picturesque giant cacti, which stand often 30 to 35 ft. high.

The task of removing all this vegetation, both root and branch, in time for the planting of cotton for the season of 1917 was one of the problems to be met. The other was the leveling and grading of such a big tract, so that by gravity flow and at just the right speed, every inch of the ground could be suitably irrigated.

In an interview with Chief Engineer E. D. Vincent, the difficulties encountered and how tractors have assisted in this work were related. It was chiefly a task for the civil engineer, the ground being divided into a large number of approximately rectangular sections for each of which the irrigating problem was worked out separately. The water supply is to be obtained from wells, twelve of which, from 300 to 500 ft. deep, are, at the time of this writing (April, 1917) already driven.

Another View of the Tractors

Here they are shown working in pairs, clearing the desert vegetation in a fraction of the time it would take a large crew of men to do it



Views of Tractors at the Arizona Desert Work

The upper left view shows two Holt caterpillars sweeping the desert of mosquito trees. The illustration shows a tree caught by the two hundred foot chain connecting the tractors, this chain being drawn along the ground in the shape of a huge "U." A whirlwind of sand is also shown above the tree. The right view shows one of the drags used after the surface has been plowed. The lower left view shows the field repair shop where minor adjustments and repairs are made on the Holts. Drags, wedge drags, etc., are also made here. The right view shows a tractor pulling a wedge-shaped drag.

The water is lifted about 60 ft. on an average by electrically driven pumps, current for which is carried 75 miles from the Roosevelt Dam power station. The main laterals or irrigating ditches are of concrete, and these are so worked out that the wells, which are below the average in their flow or less than 3 sec.-ft. are assisted by those with more ample flow. The drop or slope of the land varies from 4 to 12 ft. to the mile, and here is where the powerful Caterpillar tractors give valuable aid, as every hill has to be removed and depressions filled.

Time was the most important factor in the problem before the engineers. Mr. Vincent knowing the enormous time required by horses and by hand in chopping down trees and digging out roots, selected for this work four 75-hp. and two 45-hp. Holt Caterpillar tractors and began work on January 1. To remove the trees, a chain about 200 ft. long was connected at its ends to two of the powerful tractors which were then driven about 50 ft. apart on opposite sides of the cactus or tree to be uprooted, with the chain dragging in a long U behind. As the machines progressed, the chain making contact with the trees at their bases pulled them out roots and all. The attendants then unhooked the chain at the bottom of the U and again connected it to catch the next tree. In this manner the tractors worked with only brief stops for the unconnecting and connecting of the chains, clearing all the large vegetation that would take days for a crew of men to fell and dig out by hand.

Quick Work Routing Tree Roots

Out comes a stubborn root that otherwise would have to be blasted or laboriously dug out by workmen.

The next step was to do away with the bushes and smaller growths. For this purpose enormous triangular or wedge-shaped drags 30 to 40 ft. long were constructed of 12 x 12-in. timber, the under and outer edges being steel shod. These drags were then attached to the tractors. As a drag progressed over the land, its point entered between the bushes, forcing them apart, and, owing to its great weight and steel edge, either uprooting or cutting them off flush with the surface. In the center of the

triangular drag was usually placed a series of discs which gave the surface of the land somewhat the appearance of having been plowed. A gang of men then followed with horses and hay rakes, gathering the debris into piles which were afterwards burned.

The land was then ready for grading, which was accomplished in the usual manner, there being in addition to the tractors, about 600 head of horses and mules. Each tractor carried two disc plows of five discs, each plowing a strip 10 ft. wide. The machines were fitted with searchlights and much of the time worked day and night. After grading and plowing, the land was disced and dragged, both operations often being done at once by the tractors.

An improvised repair department was established in a tent on the grounds and here all repair work required has been done. The tent repair shop is shown in an accompanying illustration. It also serves as a carpenter shop for the construction of the various types of drags used.

The Caterpillars have been found especially useful owing to their ability to negotiate soft sand and mud, for they have to cover the ground with discs after it has been irrigated. This is known as "mulching." Although a period from three to five days elapses between the irrigating and the mulching, the ground is still soft and muddy.

A comparison of the work of the tractors on the adobe soil with that done by horses is as follows:

While an 8-horse team would plow three to four acres, the tractor would cover about 20 acres, or approximately the work of 40 horses. In fact, 20 acres was considered a 10-hour stint and 80 acres was actually plowed in four shifts covering two days and two nights. Two men were required with each tractor when plowing.

The total expense is interesting and for each of the 75-hp. machines was as follows:

Two operators' salaries	$9.50
Distillate—60 gal. at 9c.	5.40
1 qt. starting gasoline	.25
Cylinder oil—2 gal. at 60c.	1.20
2 lb. compression grease for cups at 15c.	.30
1 lb. pinion grease	.20
½ pt. transmission oil	.07
Crude oil for Caterpillar track..	.20
Depreciation	8.00
Total daily operating cost	$25.12

These figures are from the records of Ed. McMullin, who is in charge of the tractors and can be taken as authentic. It will be recognized at once that the cost of the tractor compared to the cost of 40 horses to do the same work is very low, particularly as a much larger number of men must be paid where horses are used.

The company is using eleven tractors in all, having one on a small section near Chandler and four on the land now being broken west of Phoenix. Although work was begun as late as January, over 400 acres have already been planted and it is hoped by May 15 to have over 2000 acres in seed.

MAGNETO PARTS CO., New York City, has been sold to Brown & Caine, Inc., 2112 Michigan Ave., Chicago.

ERD VALVE-IN-HEAD TRACTOR ENGINES

The Erd Motor Co., of Saginaw, Mich., is manufacturing two types of valve-in-head engines suitable for tractor, truck or heavy-duty work in general, and designed to operate on kerosene. These types differ only in the style of the crankcase and oil pan. One is the open flywheel type with four-point suspension, and the other is the enclosed flywheel type with three-point suspension. In all other respects the engines are identical. Some of the features of design are the removable cylinder head, cylinders cast in block, thorough oiling system and general accessibility.

The cylinders and pistons are of semi-steel. The piston pins turn in the piston on bronze bushings. The piston rings are die cast. The crankcase is provided with two hand hole plates on the left side. Lubrication is by the constant level splash system, oil being pumped into the connecting-rod troughs. The crankshaft is of nickel steel. The rods are drop-forged, these and the other reciprocating parts being substantially built to stand the strain of hard service. The valves and operating mechanism are enclosed, and the rocker arms are drop forged, the ends being hardened. Main bearings are die cast of heavy pressure metal of a special mixture. Connecting-rod bearings have reinforced bronze backs. Laminated shims are used in all bearings.

The bore is 4 in., stroke 6 in. The recommended speed is 700 to 1000 r.p.m. The weight complete is 800 lb. The front main bearing is 2 x 3 in., the center 2 x 2½ in., and the rear 2 x 4 in. The lower rod bearings are 2 x 2⅜ in., the upper 1¼ x 1¾ in. The camshaft is 1¼ in. in diameter. The clear valve diameter is 1¾ in. Pistons have three ¼-in. rings.

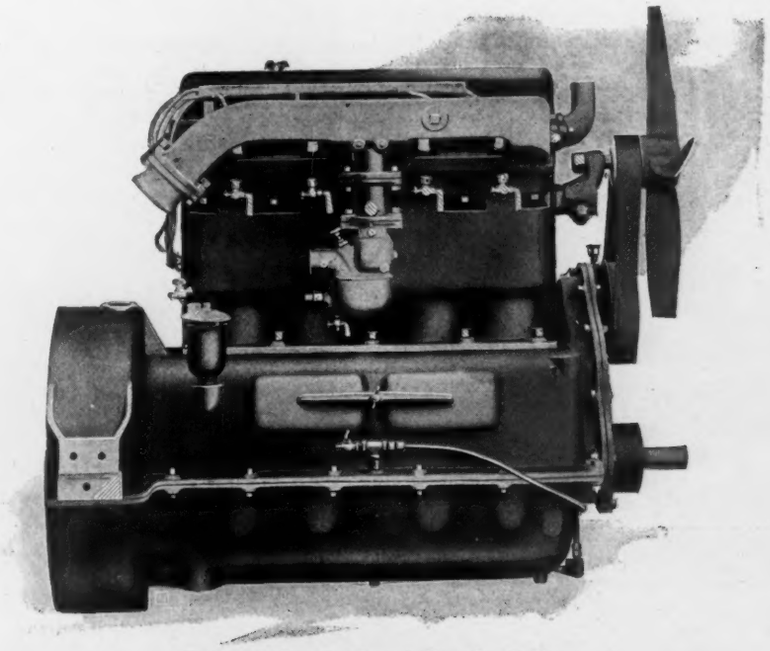
The intake manifold is cast in the cylinder head and provides sufficient velocity and heat to the mixture to properly vaporize it.

Erd engines are supplied equipped with fan, circulating water pump, oil indicator, priming cups, grease cups, drain cocks and wrenches for head bolts and spark plugs.

ADVOCATES CITY FINANCING OF COUNTRY DEVELOPMENT BY TRACTORS

Dean Thomas F. Hunt, of the College of Agriculture, University of California, points out that the tractor is the one solution of early expansion of the cropping power of American acreage. He declares that the farmers are already working every ounce of muscle and every dollar of capital to the limit of their power. Additional agricultural production requires more man power, it is true, but this will be multiplied by the use of gasoline. Dean Hunt advocates aggregations of capital in corporations which will own tractors and rent them with men to operate them to the farmers. The capital and the men must come from the cities. He declares this proposition should be worked out immediately and financed either by groups of financiers or by popular subscription, in the cities adjacent to great agricultural districts.

DART MOTOR TRUCK CO., Waterloo, Ia., has advised us that the company is being operated by the same officers and directors as heretofore, and that an erroneous report has been circulated to the effect that some farmers had traded five farms in for the control of the company and were going to run the business. The truth of the matter is that one of the company's stockholders traded in about $10,000 worth of his stock to apply on the purchase of five farms.



Right Side of Closed Flywheel Type

This is the exhaust side of the engine. This engine is constructed to operate on kerosene. The intake manifold is cast in the cylinder head, so designed to provide sufficient heat and velocity to properly vaporize kerosene.

Tractors—the Iron Work-Horses of the West

By WARREN EUGENE CRANE

THE tractor is an invention that is revolutionizing the farming and lumbering industry in the West by replacing the expensive, slow moving draft horse with the labor saving power of gasoline. At first it was believed that the only place where the tractor could become a practical accessory was upon the large farms, however, the agriculturist, with forty acres or more, is beginning to realize the many advantages of a dependable tractor for work.

It costs the American farmer an average of $132 per year to keep a horse. In addition to this, much time and labor is necessary to keep the horse in health and working condition. Sickness and accidents bring a percentage of loss every year and much valuable land space is of necessity given over to growing feed instead of profit-paying crops. When the actual pulling power of the tractor is compared with that of the horses and the proportionate weight, upkeep, feed and size are considered, the result favors the mechanical apparatus.

The light, inexpensive automobile has filled a great need in agricultural communities by bringing the farmer closer to his markets and the educational and cultural advantages of the city. Likewise, the tractor attachment means another progressive step for the farmer. If he has an old automobile with a serviceable engine, transmission and frame, he can have a farm tractor with power sufficient to do the work of four to six farm horses without duplicating this part of his equipment. As these attachments can be removed he can have his automobile for usual trips to the city when he desires.

The Universal tractor attachment,* made by the Gerlinger Motor Car Co., Tacoma, Wash., is coming into use on a large number of farms in the West. The rubber tires are removed from the front wheels and a steel tractor rim with a center flange is clamped securely in place, making a tractor wheel with a 6-in. road face. The body, mudguards and running boards are also removed. The entire rear wheels are replaced by small pinion gears which are held in place by a key and nut used on the wheels of the automobile. The rear spring is removed and a heavy tractor axle is fastened to the frame by a powerful steel clamp. This one clamp holds the big axle, the frame and the rear axle housing of the car in correct position. The small pinion gears operate on large internal gears in the big steel tractor wheels carrying the power directly to these wheels so that all pulling strains are carried by the steel tractor wheels and tractor axle.

Because of the fact that the tractor axle is placed forward of the rear axle of the machine, the wheelbase of the implement is materially shortened, making it possible to turn the tractor in a very short space. This makes it possible for them to be used in apple orchards or in small fields for cultivating, hauling, plowing, seeding, harvesting or marketing the crops.

The entire attachment weighs 1500 lb. The tractor wheels have a 14-in. face, giving 28 in. of traction surface without any dead weight to be carried. The machine can be used on an ordinary road without any change being made in the tread of the wheels.

On a farm in Pierce county, Washington, a four-year-old Ford with a Universal tractor attachment pulls two 14-in. plows at one time under ordinary conditions. It also successfully pulled three loaded wagons each of which contained a load of more than two tons each beside the weight of the wagon gears. The gasoline cost was 29 cents per acre on an average.

On a farm near Bellingham, Wash., a 2-ton truck was driven to a pit where it was

*An illustrated description of this attachment appeared in the February issue, page 309.

Five-Ton Mack Logging Tractor in Service of O'Neill Logging Camp
Hauls logs from the camp to Bothell, where they are dumped into Lake Washington

Hood Tractor Put in Service by the Canal Lumber Company, of Seattle
Uses a Ford engine and special wheels

loaded with three tons of potatoes. To get to this place it was necessary to drive over and stop on some very soft ground. When the truck was loaded the driver found, to his dismay, that the weight of its new cargo had sunk the truck wheels into the ground nearly to the hubs. A farmer, living in the vicinity, who owned a Bull tractor, offered to pull them out but the driver of the truck scorned the offer at first and tried in every way to pull his machine out of the hole with his own power. Finally he was forced to give up the task. The farmer who had the tractor, with pride in his machine, said, "I will pull you out or give you my tractor." The proposition was immediately accepted with the result that the tractor was brought over, hitched to the truck load of potatoes and, without any discernible effort, pulled it out of the hole and over at least two hundred yards of soft ground, where the wheels were sunk at least 8 in. in the mud during the entire trip.

About seventy people from Kennewick, Prosser, Horse Heaven, Grandview, Rattle Snake Hills, Mabton and Sunnyside, Wash., gathered recently on the Cameron ranch, seven miles east of Sunnyside to witness the performance of a Bull tractor. The show, which was staged by Speck and Rowland, of Sunnyside, proved successful from a business standpoint. One of the rural automobile agents, with a touch of humor, wrote a letter to the Northwest Buick Co. describing the event as follows: "The Bull started with his big foot in the furrow and, without any attention from the driver, kept the furrow from end to end and side to side of the field, which was old stubble blocked out about one and one-half miles around, and the laps were made in from 28 to 31 minutes. On one side of the field the grade was estimated at 15 per cent. This is considered rather heavy for successful negotiation by tractors. The Bull, however, showed no evidence of balking. The gang plows required a little time for adjusting, but aside from that, the ground was sliced off by the two 14-in. bottoms and turned completely upside down.

"The unanimous conclusion was that the farm tractors have come to stay. They will pull as much for ten hours as six good percherons, and at the end of that time they are willing to work right on through the night, and day after day, performing all of the work that could be done by 18 good percherons. In fact, they will run anything from a buzz saw to a threshing machine. To do this the Bull will consume distillate and lubrication costing only 50 per cent. of the amount that it would require to feed horses for the same work. The Bull may break a leg (casting), but he is not subject to wire cuts, pink eye, epizoötic, distemper, spavin, ring bone, heaves, founder and glanders. Furthermore, the minute he stops pulling he stops consuming and does not cost his owner a cent until he is taken out and put to work again. And the first cost of the Bull is much less than six good percherons.

"The entire party at the demonstration was provided with a sumptuous hot lunch served from the rear of C. M. Lowe's new 2-ton motor truck. The occasion marks a new epoch of improved cultivation and operation of farms in this vicinity."

Carl S. English, of Vancouver, Wash., has a farm that has a decidedly up-to-date equipment. In fact, it is considered to be one of the finest places in the Northwest. The house, barns and other buildings are all lighted by electricity generated from a dynamo of Mr. English's own manufacture. This is run by a gasoline engine and the electricity from it is stored in a storage battery. Among his farm implements is a Bull tractor with which he does all his plowing, harrowing and seeding. This year he plowed his land with the tractor, drawing a disc seeder behind it, and a harrow behind the seeder. When not used in plowing the tractor runs his feed mill and ensilage cutter. In addition to this he has a 1-ton truck with which he hauls his farm products to market and an automobile in which his family ride back and forth to the city.

Two Bull Tractors Being Demonstrated Near Sunnyside, Wash.

Window Display of Northwest Buick Company, Seattle, Wash., Showing Bull Tractor in Cornfield

Mr. English is a strong believer in the use of tractors and gasoline vehicles in agricultural work for three reasons: First, a saving of time; second, the increased production from his farm, as shown by a net profit of over $3000 from 15 acres of potatoes, and third, it has solved the boy-on-the-farm problem, for his sons are so interested now in the farm and the machinery that they have no desire to go to the city to live. Their auto takes them there whenever they wish to visit it.

V. J. Hall, owner of a 320-acre farm near Stanfield, Ore., has a Bull tractor which he uses in a very light volcanic ash soil. He finds that his tractor easily pulls two 14-in. plows and that they are a great saving when compared with horses. A 5-ton Mack logging tractor has been hauling logs to Bothell from various camps in Southern Snohomish County. It carried 128,420 ft. of logs in eleven days at a cost of $116.42, making an operating cost of 90½ cents per 1000 ft.

The Schwager Nettleton Co., of Seattle, operates an Ideal lumber tractor in its big lumber yard in West Seattle. They have kept an accurate account of their operat-

ing expenses and state that it averages $30 per month. Their machine, which is a small one, carries as high as 3000 ft. of green timber at a load.

S. McMath, a farmer near Elmira, Cal., has a Bull tractor which has replaced eight horses. He plowed a 40-acre field in 54 hours and only stopped his engine three different times to look at the bearings, using 85 gal. of distillate, 5 gal. of lubricating oil, ½-lb. of cup grease and 3 gal. of black oil for the roller, making a total cost of $9.26. He ran the tractor in two shifts and claims that he finds the operation cost much cheaper than that of horses because of the high price of grain and hay. During the winter with the aid of his tractor he plowed and harrowed 180 acres and lauds this implement as far more efficient than any animal in farm work.

The era of the tractor is here and the number in operation is continually increasing. War is not the only pursuit which is being affected by this invention as proved by the large number of these vehicles which are being used with satisfaction by the farmers and lumbermen of the Northwest.

SMALL TRACTORS USED FOR BREAKING NEW LAND

At Eldorado, Texas, the ranchmen are trying the experiment of growing cotton. For this purpose new land is being broken. The accompanying photograph shows one of the little 16 h.p. Moguls of the International Harvester Co., Chicago, Ill., on the ranch of John Booth, breaking six acres with a three-disc plow. The machine is being operated on kerosene at six cents per gallon in barrel lots, at very much less cost per acre, according to its owner, than the same ground could be broken with horses. On old ground the tractor pulls four discs and covers eight acres per day. The ground at this place was so difficult that stones had to be piled on the discs to hold them in. Nevertheless the machine shown is pulling a harrow in addition to the discs.

Although the photo does not show it clearly there is an automatic steering device that enables the tractor to follow a cut in old soil without attention from the operator; it will even follow the curves at the corners if of good radius, going round and round the field automatically. The device is simple, consisting merely of a disc-like wheel attached at the front by long arms to the steering pivot. This wheel follows the cut where there are no obstructions, thus guiding the tractor. At the time the photo was taken it had been in service breaking new land without requiring any attention.

The drive to the tractor wheels is by roller chain, which apparently is but slightly affected by the distortion of the machine over uneven ground and by the dirt to which it is exposed.

Little Mogul Breaking and Harrowing New Land

Three discs are held to their work by being weighted with stones. Attention is called to the automatic steering gear projecting ahead. Tractor is working on kerosene at less than one-half the cost of breaking new land by horses or mules.

ARMORED HOLT CATERPILLAR TANK IN "MOVIE" BATTLE

The American public in April had an opportunity to see in film plays and film news service a striking illustration of the efficiency and terrifying activity of a modern war "tank" in battle service. At the climax of a battle scene in "Patria," produced in the hills back of Hollywood Mountain, near Los Angeles, Cal., a Holt Caterpillar tractor was used, fitted with a reproduction of the armored superstructure used on the battlefields of Europe. The "tank" apparently had a full complement of machine guns and rifles and was manned by a crew of twelve or fourteen men. The 75-h.p. Caterpillar trundled itself across the mimic battlefield, shooting volumes of smoke from its guns, and completely routed the enemy. The audience at the theatre reproduction of this action is able to appreciate vividly the terrifying impression of irresistible force which the tank must produce upon an enemy as it advances at a steady pace, climbing over rocks and walls and ditches and tearing down barbed-wire entanglements, making a path not only for itself but for following foot troops.

Holt Caterpillar Used by "Movie" Company

This caterpillar was fitted with imitation armor plate and rapid-fire guns and rifles

It is no secret that the Caterpillar tractors of the Holt Manufacturing Co. have been used not only by the Allies on the battlefields of Flanders, but have been tested out for a considerable period by United States army officials and some of them are now in actual service with the United States army.

As far as can be ascertained the number of commercial cars in Great Britain and Ireland during 1916 was 21,358. These figures, however, are only approximate, but while they include cars, the registrations of which have not been cancelled, though the vehicles themselves have ceased to exist, the overplus thus introduced is balanced by the lack of returns from certain county authorities. The figures may, therefore, be taken as approximately accurate.

Russell Light and Giant Tractors

THE Russell and Co., Inc., of Massillon, Ohio, offers two sizes of the Russell Tractor, the 12-24 or Russell Light, and the 30-60, or Russell Giant. The former is designed to supply the present day demand, its capacity being three 14-in. bottom plows, light threshing and other general work of the farm.

The Russell Light

The Russell Light Tractor uses gasoline, kerosene, or distillate for fuel, and is equipped with a double bowl carburetor for operation on kerosene or distillate.

The engine in this model is a four-cylinder 4¼ x 5¾ in. It is water-cooled, water being circulated by a centrifugal pump, and ignition current is furnished by Bosch magneto. A honeycomb radiator is used. The capacity of the cooling system is 6½ gal. A 20-in. fan assists cooling. The engine governor controls the speed by a throttle.

The crankshaft r.p.m. is 650. The rated tractive h.p. is 12; the rated belt h.p., 24. The oiling system capacity is 1½ gallon. The connecting-rods are steel forgings, double heat-treated. The crankshaft is drop forged of high carbon steel, heat treated, and ground to size. Lubrication is by circulating splash system.

The clutch is raybestos lined. The transmission provides three forward speeds and one reverse speed. The direct drive through the transmission is on the second speed, this being used almost entirely in the field. This direct drive provides a speed of 2½ m.p.h., low giving 1½ m.p.h., and high 3¾ m.p.h. The drawbar pull on direct drive is 2000 lb.; on low, 3000 lb. The transmission gears operate in oil and are always in mesh. Annular ball and roller bearings are used throughout the transmission. The belt pulley is 12½ x 7 in.

The wheelbase is 7 ft. 10 in., overall length 11 ft. 7 in., height, 8 ft. to top of cab. The shipping weight is 5500 lb. The frame is heavily built of Carnegie steel. Channels riveted and braced. The drive wheels are 53 x 10 in. Center hitch with perfect line of draft is furnished, but the lateral drawbar hitch can be had as well. The fuel tank capacity is 20 gal. of kerosene and 3 gal. of gasoline.

The 30-60 Giant Russell

The Russell Giant has a rated tractive h.p. of 30, with 60 h.p. at the belt. The engine has four cylinders cast singly, bore

The 12-24 Russell Light Tractor
Has a capacity of three 14 in. plows. It has a three speed forward and reverse transmission, with direct drive on second speed.

8 in., stroke 10 in. A 2-in. double bowl carburetor allows the use of either gasoline or kerosene. Ignition is by Bosch high tension magneto. The governor operates by a throttle in the intake. The crankshaft speed is 400 r.p.m. The oil system capacity is 3½ gal. Lubrication is by splash and force feed to all bearings. All moving parts are enclosed in dust-proof compartments. An open brass tube radiator is used. A 41-in. fan assists cooling. The cooling system capacity is 70 gal.

The clutch is of the 3-shoe wood-faced type. The transmission has two speeds forward and one reverse, and the gears are of unusual size and strength. The machine travels 1¾ m.p.h. on low gear and 4½ m.p.h. on high. The drawbar pull at plowing speed is 9000 lb., the plow capacity being eight 14 in. bottoms. The drawbar is 22 in. in height. This machine has a wheelbase of 12 ft. 5 in., has 84 x 22-in. drive wheels, and weighs 22,000 lb. The large fuel tanks hold 22 gal. of gasoline and 88 gal. of kerosene.

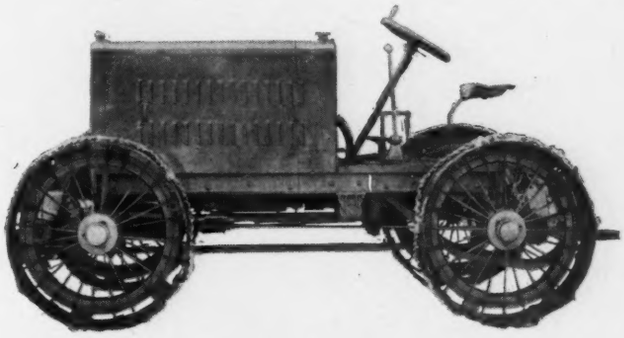
THE TOPP-STEWART FOUR-WHEEL DRIVE TRACTOR

The Four Wheel Tractor Co., of Clintonville, Wis., has announced the Topp-Stewart Tractor for general work on farm lands, the feature of which is the four wheel drive and four wheel steer. The machine is simply constructed and most parts are of steel. The machine is light and has most of the weight in the engine and the frame. It will turn in a small circle, thereby leaving little land in the fence corners untouched. Rear wheels follow the front wheels when turning and the plows are close attached, thus making the plow follow the front wheels closely. The tractor is capable of pulling from four to six plows. Its adjustable drawbar is attached in the center. Steering is accomplished by power from the engine.

The engine is a 4 cylinder 5 x 6-in. Doman, description of which appeared in the May 15, 1917, issue, page 47.

The pulling power of this tractor is 4500 lb. The transmission gives three speeds forward and one reverse, the respective

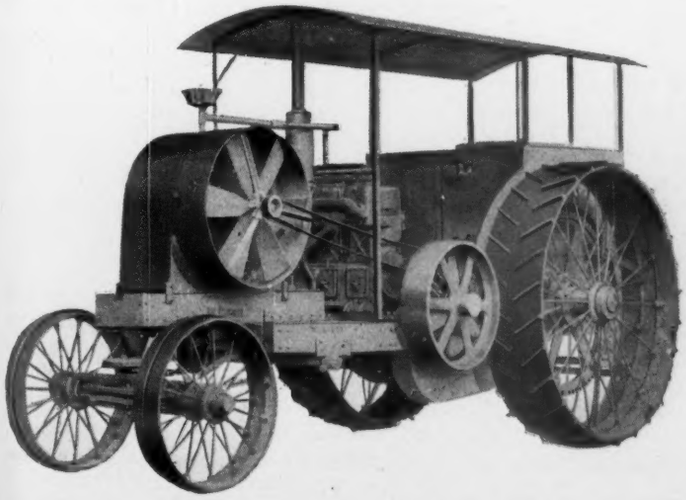
The Topp-Stewart Tractor
This is a four-wheel drive-and-steer tractor. It has a Doman engine. Traction is secured by the loose steel sliding lugs that grip the ground. These are applied without bolts, screws, or nuts.



gears producing 1½, 2⅜, 5 m.p.h. and 2 m.p.h. on reverse. The 14 x 8-in. pulley has a speed of 600 r.p.m., giving a belt speed of 2200 ft. per minute. The drive wheels are 42 x 12 in.

The radiator used is a Purfex. Fuel tank capacity is 20 gal.

Hyatt and Timken roller bearings are used where necessary. Schebler carburetor and Splitdorf plugs are standard equipment. The tractor shipping weight is 600 lb. The dimensions are: Length, 138 in.; width, 78 in., and height, 64 in.



The Russell Giant Tractor
This is rated as a 30–60 tractor. It is equipped with a four-cylinder engine, 8 x 10 in. The maker states shields over the rear wheels are now standard equipment.

MAHIN ADVERTISING CO., New York and Chicago, has changed its name to the Wm. H. Rankin Co. Wm. H. Rankin is president, and the other officers are Wilbur D. Nesbit, vice-president; Herman A. Groth, secretary-treasurer.

The Electric Vehicle and the War

By A. JACKSON MARSHALL, Secretary Electric Vehicle Section, N. E. L. A.

WITH the advent of the war abroad, and especially in England, Germany and Austria, the electric vehicle was given a splendid opportunity to prove its dependability,, economy, and its adaptability to all sorts of passenger, commercial and municipal uses.

Since the gasoline vehicle is better suited than the "electric" to the field of battle, nearly all the gasoline automobiles, both passenger and commercial, were commandeered along with all the best horses, and in many cases the skilled drivers were requisitioned with their vehicles. A large number of electric vehicles were ordered to handle urban transportation, and inexperienced men, and to an even greater extent, women were obliged to become drivers of these vehicles. The "electrics" met these conditions admirably, because of their simple mechanism and ease of operation, and the new drivers rapidly mastered their simple problem of operation. It was only a very short time before the new users of electric vehicles were convinced that these cars were entirely satisfactory from every aspect and cheaper to maintain than either horses or gasoline vehicles had been.

With an abundance of coal for making current, England naturally could operate electric vehicles more economically than gasoline cars. In 1914, at the beginning of the war there were only 150 electric vehicles in use in England, and the number has increased in 2½ years to 858, which increase is nearly six times the number of "electrics" which had been put into use in England during the ten years previous to the war, there were only 150 electric vestallations will be permanent even when the gasoline cars are released at the end of the war. While it is necessary to serve the field of battle, it is equally important that munitions and other more peaceful commodities should be transported in the cities. England showed farsightedness in adopting "electrics" on such an extensive scale, and it was distinctly a patriotic, as well as a good, business move.

Since both Germany and Austria have been cut off from the world's supply of petroleum, and because electric current is unusually cheap, due to the abundance of coal the Germans are mining from the territory in France which they hold, the use of electric vehicles in these countries has been greatly augmented during the last two years. As the railroads in Germany are used chiefly as military transports, many trackless-trolley lines have been installed between industrial centers, and vehicles propelled by single or double electric motors are employed current being drawn from overhead conduits. When these vehicles reach the terminals of the trolley they proceed to their destination under the power of the electric battery which they carry. Austrian reports state that the city of Vienna is about to adopt a policy of denying licenses to gasoline cars and granting them only to "electrics." This city has particularly fine facilities for supplying electric current, and transportation will be fully as efficient as with the use of gasoline vehicles, as well as less expensive.

It is possible that developments in this country may necessitate the commandeering of gasoline vehicles. If the embargo which may be placed on the oil fields of Mexico is effective, or if the oil fields should be destroyed, England would have to secure petroleum elsewhere for fuel for her warships, which would not only greatly decrease the present supply in this country, but would also probably tend to make the cost of gasoline extremely high. Many large transportation fleets are composed of electric vehicles, and they would be of considerable value in supporting industrial activities. At least two of the largest central stations have already tendered the government their fleets consisting of about 200 "Electrics."

The installation of electric industrial trucks in factories would greatly decrease the number of employees necessary, and materially increase the production. Experience has shown that a battery-propelled truck driven by one man can accomplish as much work as five men using hand-drawn trucks and in less time.

In war time economy must be very carefully considered, and the electric vehicle competently meets all demands of urban transportation at the lowest operating cost, with the greatest efficiency.

PIERCE-ARROW MOTOR CAR CO., Buffalo, N. Y., shows net earnings of over $4,000,000 during 1916 after all depreciation charges were deducted. During the year the company's business fell away considerably, but its plant is working to capacity mostly on domestic business.

THE CITY COUNCIL OF BROOKINGS, S. D., has placed an order with the Luverne Automobile Co., of Luverne, Minn., for a Luverne fire truck of the combination chemical and hose truck type. It will be a six cylinder, 60 h.p. outfit, equipped with two 40 gallon Holloway type chemical tanks, with a hose body suitable for carrying 1200 ft. of hose. It will also be equipped complete with ladders and all auxiliary equipment, and all metal parts will be nickel finish.

For the successful promotion of this partial relief, with its attendant comfort and speed, the Chicago public is indebted to Roland R. Conklin, president of the Chicago Motor 'Bus Co., who has underwritten all their obligations up to the present, with Stanley L. Conklin and Harold B. Weaver, who form the Executive Committee, and also to George D. Crowley, who has represented the Executive Committee in the successful promotion of the project.

On this line "the fresh air way to everywhere," under the terms of the franchise, the fare is 10 cents.

THE MOTOR TRUCK IN HIGHWAY BUILDING

[The opposite page of illustrations and the following information concerning them appeared in a recent issue of The Road Maker. As they are just as interesting to our readers, although for different reasons, we asked permission to reprint them.—Editor.]

The outstanding feature of the development of highway building and, for that matter, all kinds of public work in the last ten years, has been the motor truck. Within the past three or four years there have been developed many types of heavy-duty trucks designed for the handling of material in large quantities at a minimum expense.

With the great increase in the building of hard roads, more economical methods of making long hauls of material became necessary. The building of motor trucks, carrying from 5 to 10 tons and often using trailers, has made it possible to greatly reduce the time and expense necessary to this great public work. Doubtless a large number of our readers will be interested in the illustrations on the opposite page showing various types of motors used in Europe and America, and in a brief description of a few representative machines.

Figs. 5 and 8 show two English dumping trucks developed at the Onslow Works, Guildford, England. The former is utilized by the Surrey County Council, and the other in road-building by the Hambledon Rural District Council. These end-tipping and side-tipping trucks will carry 6 tons. Both bodies can be tipped easily by hand. In many cases they have power-tipping gear, but as this complicates the machine, most English engineers advise the simple hand-tipping arrangement.

The side-tipping machine (Fig. 8) is particularly successful, and has been shifting 36 tons a day at low cost 5 miles from its base, the daily mileage.

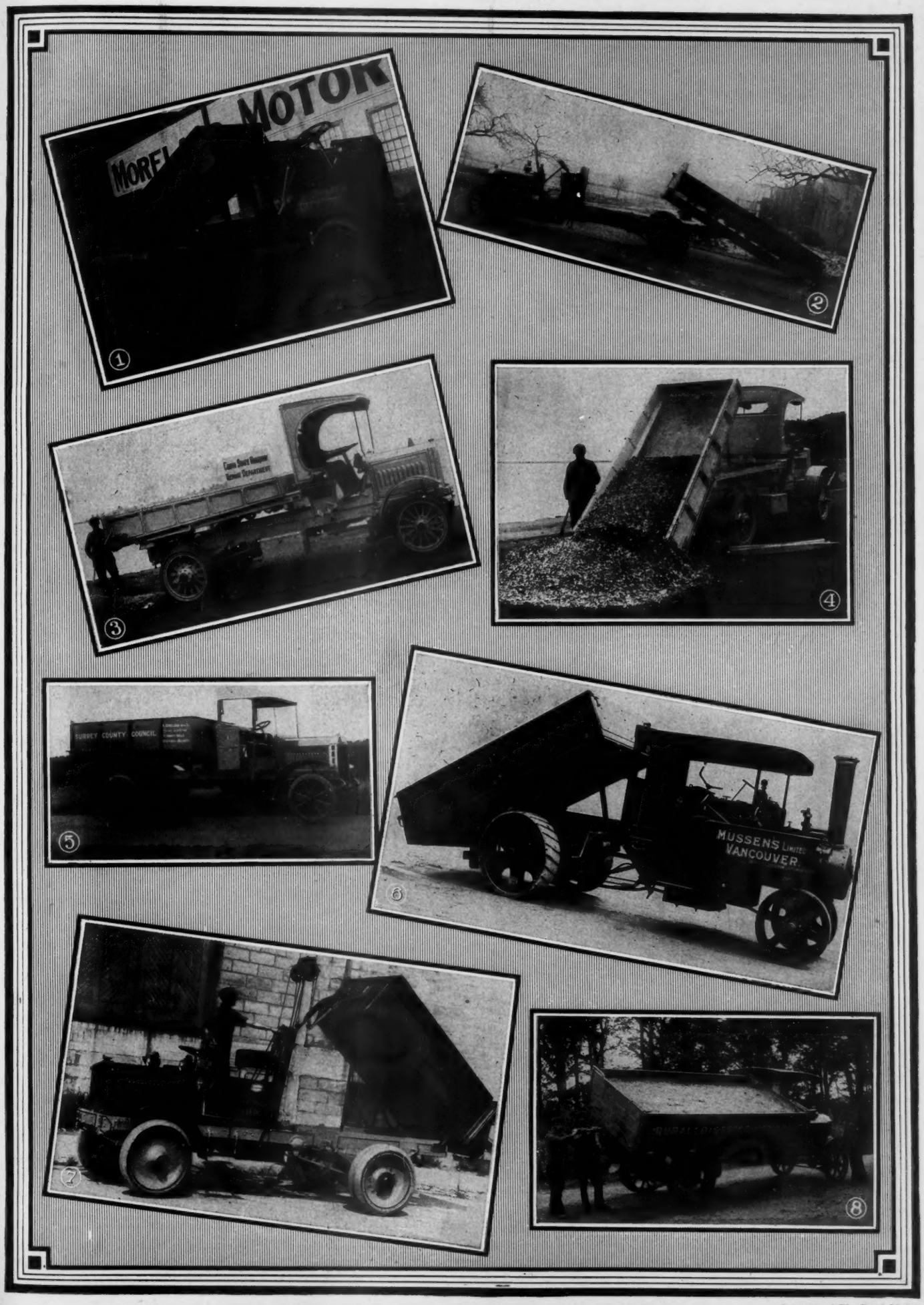
Fig. 2 shows a municipal dumping truck developed at Gattenan in Baden, Germany.

The American-built dumping truck (Fig. 7) is equipped with a Federal motor, designed at Detroit, Mich., and has been much used in municipal asphalt paving service at Pittsburgh.

Fig. 1 is an American dump truck for handling gravel and dirt, at Los Angeles, Cal., and Fig. 6 shows a steam dumping truck of the English type of Mussens, Ltd., of Vancouver.

Figs. 3 and 4 are two types of dumping trucks designed at Bridgeport, Conn., and are operated by the Connecticut State Highway Commission's repair department. This truck has a 4-cylinder, 42 h.p. engine.

SPACKE MACHINE & TOOL CO., Indianapolis, Ind., announces that it has discontinued the manufacture of air compressors and is devoting its entire efforts to the manufacture of automobile axles, engine and transmission parts, special hardened and ground pieces and its line of De Luxe engines.



Courtesy of The Road Maker

See opposite page, "The Motor Truck in Highway Building"

Introducing the Higrade Truck

A WORM-DRIVE power wagon between the big tonnage jobs and the small delivery cars is the offering of the Higrade Motors Co., Buffalo, N. Y., who intend commencing production in July. Deliveries are planned to begin about August first. The Higrade chassis is designed with an unusual factor of safety and is claimed capable of carrying all the pneumatic tires are guaranteed to carry, and stay within the tire 'makers' guarantee for maximum mileage. The standard series A-17 chassis weighs 2300 lb., and the maximum allowable load on chassis, including body, is 2250 lb. By using special over-size 35 x 5-in. tires the net carrying capacity would increase 25 per cent. and still not overload the springs. These trucks have well balanced lines and pleasing appearance. There is no overhang on the chassis frame, but still they have a floor loading space of 104 in. back of the driver's seat. A new and original feature for commercial cars is the special designed lamp brackets, which provide a convenient and fixed adjustment for properly focusing the rays of the electric lamps at any given distance desired.

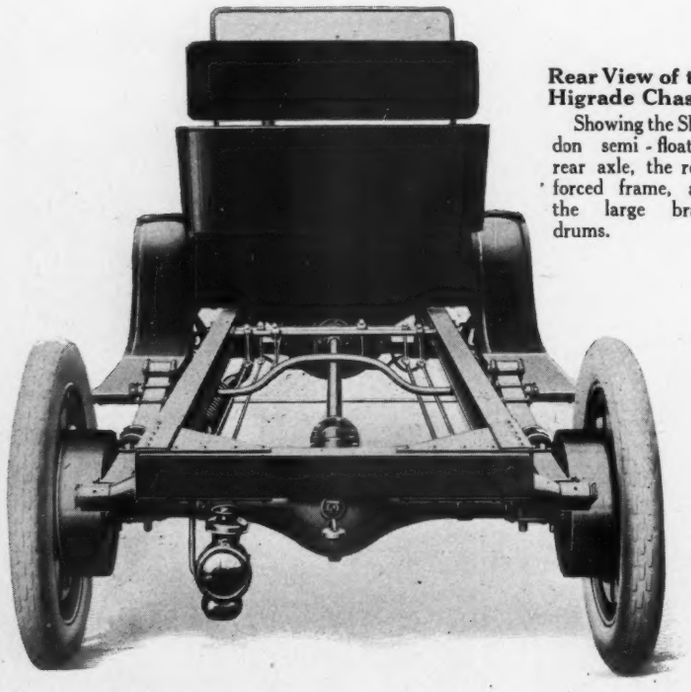
Normally the car speed will equal 20 m.p.h., being controlled by a Simplex governor driven from the propeller shaft. Gear ratio furnished on the standard chassis is: low, 8.56 to 1; intermediate, 6.56 to 1; high, 4.56 to 1, and reverse, 10.68 to 1.

Standard equipment includes speedometer, motometer, electric head lights, windshield, dash and rear oil lamps, electric horn, necessary tools in tool box, jack, oil can and one gallon of oil. An extra rim and tire holder is also furnished. The entire chassis is finished in battleship gray, except the radiator, hood, fenders, steering gear, dash and seat unit, which will be black, baked enamel.

A Wisconsin 3¼ x 5-in. engine is the power plant. The four cylinders and the upper part of the crankcase are cast in block of high grade gray iron, with ample water jacket space around the cylinders and valve ports. The cylinder head is removable, being held in place with studs, a metal gasket being between the cylinder and head to prevent leakage. This construction permits easy access to valves and pistons for cleaning. The lower crankcase is of nickel aluminum alloy and can be easily removed for the adjustment of the connecting-rod and crankshaft. Bearing pistons are of fine gray iron, accurately ground to size. Each piston is fitted with eight narrow steel expansion rings, which are carefully ground on both faces and on the outside. All pistons are weighed and balanced.

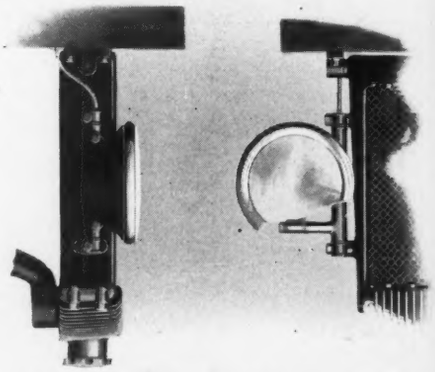
Connecting-rods are of the I-beam construction, made of 35 to 45 per cent. carbon steel, drop forged and heat treated. All connecting-rod bolts are made of chrome vanadium steel, heat treated. The crankshaft, which is 2 in. diameter, is made of chrome-nickel steel, drop forged and fully heat-treated, giving it a tensile strength of about 125,000 lb. per sq. in. The camshaft is drop forged from a single piece of low carbon steel, with the cams integral with the shaft. This shaft runs in long phosphor bronze bearings, and is lubricated by the oil that collects in the oil pockets which are cast in the bearings for this purpose.

The inclosed valves, which are of generous size, are mechanically operated on one side of the engine by a single camshaft. Both intake and exhaust valves are interchangeable and are of Tungsten steel. Removable valve stem guides are provided, which can be replaced in case of wear. The valve tappet guides are separate castings, and can be easily removed, being held in place by means of a forked crab forging. By loosening this crab the complete tappet assembly, including the guide, can be taken out without disturbing other parts. A re-



Rear View of the Higrade Chassis

Showing the Sheldon semi-floating rear axle, the reinforced frame, and the large brake drums.



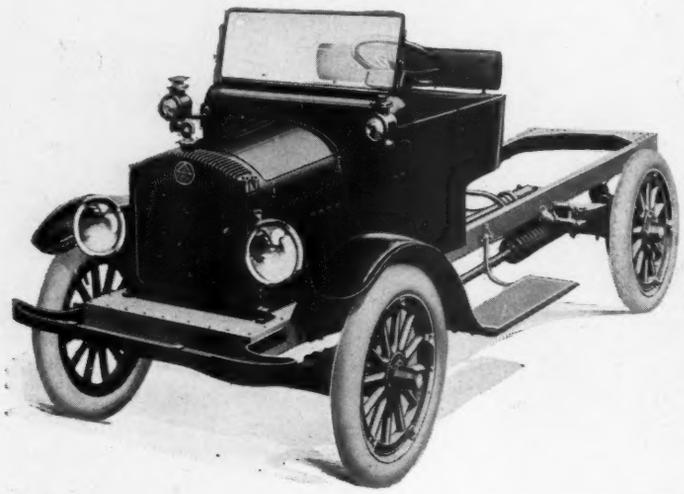
The Special Designed Lamp Brackets Furnished on Higrade Trucks

Provide a convenient and fixed adjustment for properly focusing the rays of the electric head lamps at any given distance.

movable metal plate covers the valves, which keeps them free from dirt. All timing gears are helically cut, material being semi-steel and steel. Liberal crank and connecting-rod bearings are made of high grade Fahrig bearing metal with bronze backs. Oil is circulated by means of a plunger pump, driven from the camshaft and accessibly located on the side of the engine.

A Zenith, fixed-nozzle type of carburetor is bolted direct to the cylinder block intakes, and is equipped with a shut-off to facilitate starting in cold weather, the complete control being mounted on the control box located on the steering column. Gasoline is carried in a pressed steel tank, located on the dash, which gives gravity feed to the carburetor. Ignition is by a high-tension single system, while lighting is by a generator, gear driven, a distinctive and separate unit from the ignition. The starting system is of the balance-wheel type, with steel ring gear and Bendix drive.

The radiator is of the flat tube type, with aluminum cast header tank, the core being bolted in place. This construction allows for quick repairs in case of damage to a cooling section. A motometer is attached to the filler cap as standard equipment, and on each side of the radiator the special designed lamp brackets are provided. The clutch is a single plate, Borg & Beck, which is simple in adjustment and positive in operation.



Front Three-Quarter View of the New Higrade Chassis

This view shows the specially designed lamp brackets, the control board mounted in front of the steering column and just below the steering wheel, and the flat-tube type radiator with aluminum cast header tank.

The transmission is the Cotta selective type individual clutch system. All gears are always in mesh. Speed change gears are mounted on ball bearings designed for heavy duty work. Ratios are as follows: first speed, 4 to 1; second, 2 to 1; third, 1 to 1, and reverse, 4.125 to 1.

Springs are alloy steel, semi-elliptic front and rear. Front springs are 36 in. long and 2 in. wide, while the rear are 50 in. long and 2½ in. wide. Wheels are 34 in. diameter, heavy artillery type, with spokes mounted centrally in the felloe. Two sets of brakes are provided, both being on the rear wheels. One set is operated by an emergency lever mounted on the transmission, and the other set operated by a foot pedal. All are of the internal expanding type. Steering is by the Lavine truck-type steering gear. All wearing parts are hardened and ground accurately to size and simple means of adjustment are provided. Spark and throttle levers are mounted on top of the wheel.

The front axle is a Sheldon, drop forged, I-beam axle of large cross-section. Spindles are 1 9-16 in., equipped with taper roller bearings.

Final drive is through a Sheldon worm-drive semi-floating axle. Bearings throughout are double row annular ball. The frame is of pressed steel channel section, 4 in. deep and 2½ in. wide. Full gusset plates reinforce the top and bottom on each corner, and the stock used is 3-16-in., fully heat treated.

A control board is mounted directly in front of the steering column and just below the steering wheel, in which are mounted all switches and electric instruments, including speedometer and carburetor adjustments.

Tires are 34 x 4½-in. pneumatics, front and rear; oversize of 35 x 5 in. at an extra cost. The tread is 56 in., both front and rear.

THE ACASON ONE AND A HALF, TWO, AND FIVE-TON MODELS

These three models, produced by the Acason Motor Truck Co., Detroit, Mich., were mentioned along with the extensive description given the 3½-ton model in the July, 1916 issue of the Journal, page 227. Practically all of the general specifications are the same as found in the 3½-ton chassis and only the differences will be mentioned. The 1½-ton model has a Waukesha TU4 type engine 3½ x 5¼ in., while the 5-tonner has a Waukesha 4¾ x 6¾ in. type PU4 engine, the 2-ton truck having the same engine as the 3½-ton model. Springs measure on the 1½ and 2-ton models, front, 40 x 2½ in., rear, 50 x 3 in.; and on the 5-ton, 40 x 3 in. front and 50 x 4 in. rear. The axles in the two lighter models are Timken-David-Brown worm, no. 6552, while for the 5-ton type the no. is 6752. As to tires, they measure on the 1½-ton model, front, 34 x 3½ in., rear, 36 x 5 in. On the 2-ton, front, 34 x 4 in.; rear, 36 x 6 in., and on the 5-ton, front, 36 x 6 in.; rear, 40 x 6 in. dual. Pressed steel, 5¾-in. section and ¼ in. material is used in the construction of the 1½-ton chassis, and the 2-ton chassis is the same. In the 5-tonner, however, the pressed steel frame has a 9-in. section and is of 5-16-in. material, trussed. The driveshafts are tubular, fitted with Blood universal joints in the 1½ and 2-ton models, and solid with a center bearing, and Blood joints in the 5-ton size. In order the wheelbases are 130 in., 150 in. and 192 in., respectively, and the maximum speeds 18 m.p.h., 16 m.p.h. and 11 m.p.h.

Equipment on all models include oil side lamps, horn, jack and tools. The Acason 5-ton truck is called the Super 5, and this chassis has 192 in. wheelbase and may be fitted with a 17 x 7-ft. stake body.

Cab tops, curtains and windshields can be furnished from stock at moderate prices, also standard stake bodies.

1½	ton,	5 ft. 6 in. x 12 ft.	36 in. stakes
2	ton,	5 ft. 6 in. x 12 ft.	36 in. stakes
3½	ton,	6 ft. 6 in. x 13 or 14 ft.	42 in. stakes
5	ton,	6 ft. 6 in. x 13 or 14 ft.	42 in. stakes

Steel dump bodies with Wood hydraulic hoists may also be had for any of the models. All of the models have 24-gallon steel tanks, except the 1½-ton, which has a 20-gallon tank.

Prices will be furnished on application.

HAYES MOTOR TRUCK WHEEL CO., St. Johns, Mich., recently re-elected its former directors. C. E. Hayes was re-elected president. The other officers elected are N. S. Potter, vice-president and treasurer; W. C. Morrey, vice-president and timer manager, and H. J. Keller, superintendent.

The Acason Five-Ton Truck With Stake Body

This model is called the "Super-5." It is shown equipped with a 17 x 7 ft. stake body. The wheelbase is 192 in., and the engine a Waukesha 4¾ x 6¾ in., type PU4

On the Job!

Nothing stronger could be said about any truck. And it is this feature of being ***"always on the job"*** that is the very backbone of SIGNAL success.

It is recognition of the fact that a truck pays a profit only when it's hauling—not when it is standing idle—that led to the wonderful simplicity of SIGNAL design and the quality of SIGNAL construction.

The SIGNAL Truck has the cleanest mechanism in the business. It's clean in two ways. ***First,*** it's clean because it's simple—not an unnecessary bolt or lug—no frills. ***Second,*** it's clean because every constructional unit—motors, transmission, axles, steering gear, frame, springs, wheels, tires, magneto—every unit is the best that can be built regardless of price or any other consideration—there's no room for suspicion that ***any*** feature ***might*** be better.

When you absorb that fact, you will have the secret and the backbone of SIGNAL success—and why SIGNAL sales are rolling up faster than ever.

Write at once for full details of the Signal line.

SIGNAL

Motor Truck Co.

DETROIT, MICHIGAN

SIGNAL 1-1½-2-3½-5 TON

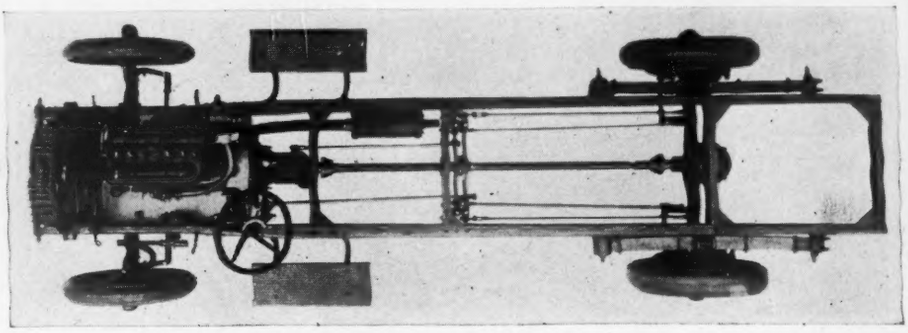
The Master Two-Ton Truck

MASTER Trucks, Inc., 3132-36 Michigan Avenue, Chicago, Ill., is a new company which recently entered the commercial car field, specializing on a popular priced 2-ton truck, known as the Master. It is claimed that this vehicle is the development of fourteen years' experience with a group of motor truck experts, which Frank Dawson, chief engineer and factory manager, has gathered about him.

Five months ago the work of designing the vehicle was started and since then fifty trucks have been delivered and the present production has reached a total of 15 weekly. The present plans are to increase this to five a day shortly.

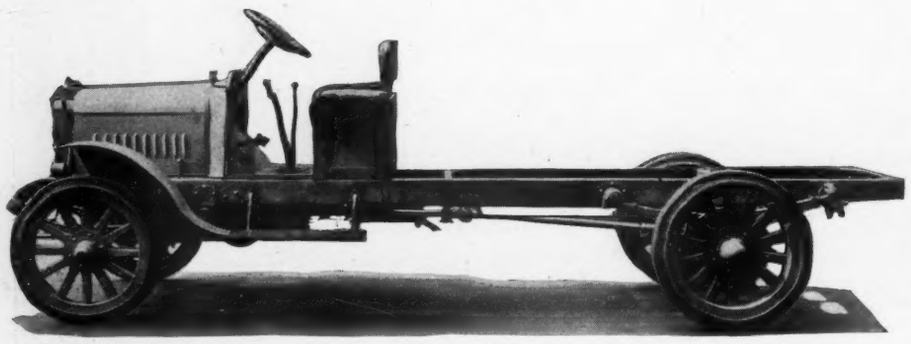
The Master truck is of the assembled type, incorporating units which are especially adapted to heavy truck service. Features which have given continued service have been improved. Specifications include pressed steel frame, reliable steering device, high powered long stroke engine with force feed lubrication, alloy steel heat treated springs, internal gear drive and two-piece propeller shaft.

The frame is made from high carbon steel of special analysis and specially designed to give strength without additional weight. Channel sections are 6 1-16 in. deep, ¼ in. stock, the flanges tapering and having their greatest width at the point of offset. Four cross members, hot riveted, reinforced by gusset plates add additional strength to the frame. All spring hangers and brackets are made from electric furnace steel and are also hot riveted to the frame. The standard wheelbase is 144 in. and provides a loading space of 120 in., while a 170-in. wheelbase can also be supplied, giving 13 to 14 ft. loading space.



Plan View of the Master Chassis

Note two-piece propeller shaft and three Anvac universal joints. Final drive is through a Torbensen internal-gear drive axle



Side View of the Master Chassis

Has Buda engine in unit power plant, 4¼ x 5½ in. Comes in two wheelbases, 144 in. and 170 in., which sell for $1890 and $1975, respectively

Power Plant

The engine used is the Buda unit power plant, having four cylinders cast in block and of L-head design. Enclosed valves afford protection from dirt and dust. The bore is 4¼ in. and the stroke is 5½ in., developing 28.9 hp. at 1000 r.p.m., S. A. E. rating. Three-point suspension is claimed to insure perfect alignment and flexibility under all conditions. Lubrication of the engine is by a high efficiency pressure feed system, oil being carried to all bearings under pressure through holes drilled in the crankshaft. The camshaft and piston pins are lubricated by means of passages connected with the pressure feed system. Pistons, cylinders and cams are lubricated by oil thrown from the lower ends of the connecting-rods.

The cooling system consists of a centrifugal pump, four blade pressed steel fan, honeycomb radiator core with cast tanks and frame mounted on ¼-in. steel springs to relieve vibration from road shocks.

The clutch is of the multiple dry plate type with Raybestos faced discs. The transmission is of the selective sliding gear type, having 3 speeds forward and a reverse. Annular ball bearings are used throughout, while the gears are made from nickel steel and the shaft from chrome nickel steel. The transmission provides a gear reduction of 3:1 on first, 1.7:1 on second and 1:1 on high, while the reverse is 3.5:1.

Drive to the rear axle is through a two-piece propeller shaft and three Anvac universal joints, final drive being through a Torbensen internal gear drive axle with drop forged I-beam load carrying member. The power transmission unit is of the high speed type, materially reducing the weight and strains on the driving members, as the main gear reduction is made in the wheels.

Equipment

Bower roller bearings are used throughout and the load carrying member is guaranteed for the life of the truck. Wheels are of the artillery type with square spokes. Tires are 34 x 4 in. front and 36 x 6 in. single rear of the pressed-on type.

The usual two sets of brakes are provided, the service being operated by a foot pedal, and is of the external contracting type, 18 in. diameter. The emergency brakes are of the internal expanding type, 17½ in. diameter and operated by a hand lever. Pedals and control set are mounted on the transmission. The front axle is of Timken design with drop forged I-beam center and Timken roller bearings.

The springs, which are made from heat treated alloy steel, are of the semi-elliptic type front and rear. They are unusually long and wide, the front being 44½ in. long, 2½ in. wide, with 11 leaves and rear 52 in. long, 3 in. wide with 13 leaves. Spring shackle bolts are hardened and ground and provided with oil cups.

The steering gear is of the worm and split nut constructive, semi-irreversible type of Ross design and manufacture.

Other designs include a Master carburetor, with governor attached, an air adjustment on the steering column, Bosch high tension magneto with set spark, and the usual equipment of three oil lamps, tool box, tool kit and horn. The price of the 144-in. wheelbase model is $1890 and $1975 for the 170-in. wheelbase in prime coat.

PACKARD MOTOR CAR CO., Detroit, has formed a technical service board, composed of eight experts from the largest points in the Packard organization. The members of the board will convene monthly at the factory and will discuss general conditions of service, and direct their efforts particularly to the standardization of service on Packard cars and trucks. The members of the board are the technical managers of the dealerships in New York, Philadelphia, Boston, Cleveland, Chicago, St. Louis, Detroit and Pittsburgh.

Hewitt-Ludlow Trucks Come in ¾, 1, 1½, 2, 2½, 3½ and 5 Ton Capacities

THE Hewitt-Ludlow Auto Co., San Francisco, Cal., is offering a line of trucks which are made in seven different capacities, the 3½ and 5-ton models being chain driven, while the lighter are worm drive. However, the 1½, 2 and 2½-ton models can be equipped with chain drive if desired. Buda 4-cylinder cast in block type engines are used in all of these trucks, the first two having 3½ x 5⅛ in., the next three in order 3¾ x 5½ in., and the last two 4¼ x 5½ in. Corresponding to the various size cylinders the horsepowers are 25 at 1500 revolutions, 30 at 1200 revolutions and 35 at 1200 revolutions.

Lubrication is all by splash and a positive plunger pump. Cooling is by the thermo-syphon system in the ¾ and 1-ton models and by centrifugal pump in the others. Honeycomb type of radiators are utilized and the fans are belt driven. Ignition is by the Remy dual magnetic system and storage battery. Stromberg carburetors with hot air attachments are used throughout the line. The control is left-hand drive with center control, hand throttle and foot accelerator. In the ¾ and 1-ton sizes multiple disc, dry plate clutches are used, while in the remainder they are leather faced cone type. The selective type of transmission is incorporated in all models, having three speeds forward and one reverse. All springs are semi-elliptic. The first two, the ¾ and 1-ton models, have front springs 2¼ in. wide and rear 2½ in. wide; the 1½, 2 and 2½-tonners, 2½ in. front and 3 in. rear, while the 3½ and 5-ton models are 3 in. wide front and 3 in. rear. All of the front axles are heavy forged I-beam section, while the rear are of the semi-floating worm gear type except in the 3½ and 5-ton sizes, which are heavy drop forged, rectangular section. Wheel diameters are, corresponding respectively to truck capacities, 34 in., 34 in., 36 in., 36 in. and front 36 in., rear 40 in. All service brakes are of the external contracting type, while the emergencies are internal expanding. Tires are all solid and are, in order, 34 x 3 in. front, 34 x 4 in. rear; 34 x 3 in. front, 34 x 4 in. rear; 36 x 3½ in. front, 36 x 6 in. rear; 36 x 3½ in. front, 36 x 7 in. rear; 36 x 5 in. front and 40 x 5 in. dual rear. Wheelbases are respectively 120 in., 126 in., 126 in., 140 in., 144 in. and 156 in. Gasoline tanks all have 20 gal. capacity and equipment includes electric tail and side lights, storage battery, fenders, horn, seat and tool kit.

The price for the 1½-ton model is $2270, for the 2-2½-ton, $2250, for the 3½-ton worm drive $3350, and for the 5-ton chain, $4500. These prices are for chassis only and are f.o.b. San Francisco.

The Two Ton to Two and a Half Ton Hewitt-Ludlow Truck Chassis

It is shown here in the worm-drive type, but it may also be had in chain drive.

HARVEY COMBINATION ARMY TRANSPORT TRUCK

The Harvey Motor Truck Co., Harvey, Ill., manufacturers of heavy duty motor trucks, have recently designed and now have in operation a combination truck that can be used for transporting troops and also freight.

This truck is 2½-ton capacity and is equipped with a body that is 6 ft. wide by 12 ft. long, and carries conveniently 32 men. There are three rows of seats placed longitudinally and the men sit astride of them as on a horse. By this method of seating it requires less room per man and utilizes all available space. These seats can be dropped in a few minutes, thereby giving a flat platform or a stake body which can be used for transporting freight, baggage or other supplies.

It is claimed that a non-convertible strictly passenger truck with a moderately extended frame, built on this principle, can transport as many as sixty men.

The chassis on which this body is mounted is a standard model of the Harvey Motor Truck Co. and is said to be in line with the latest specifications that the War Department issued in April, 1917, having the latest type engine, four speed transmission placed amidship, worm drive axle and dry disc clutch.

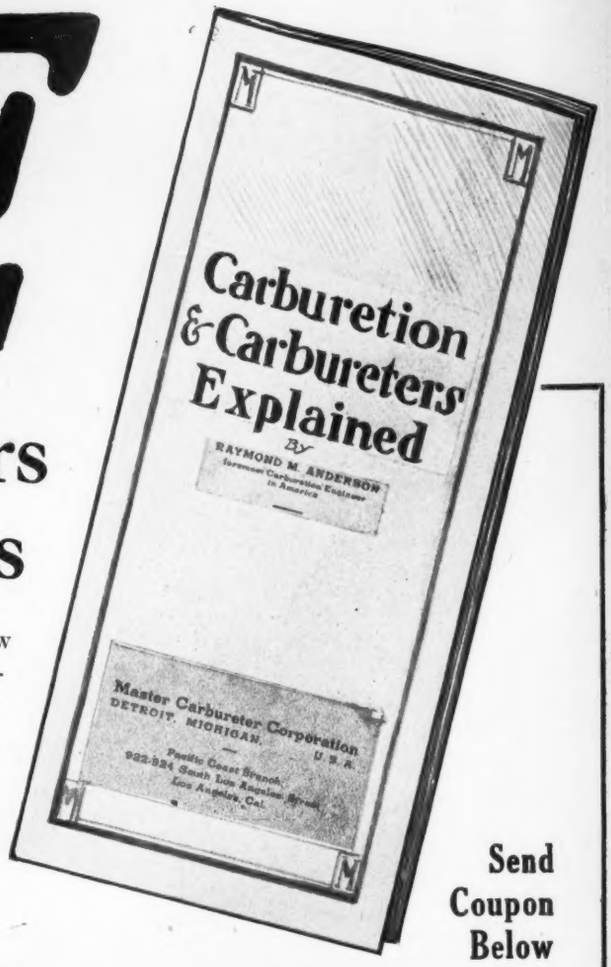
Hewitt-Ludlow's Five-Ton Chain-Drive Model Chassis

Has Buda four-cylinder in-block type engine, Stromberg carburetor and Remy dual-ignition system, and sells for $4500, f. o. b. San Francisco.

NILES MOTOR & MFG. CO., Niles, O., which is now manufacturing a 1- and 2-ton worm driven truck, will in a short time add a 3½- and 5-ton truck to its line. The company has adopted a new sales plan which is that no sales will be made direct from the factory to the consumer except through its agencies, nor will the company give anyone any discounts either directly or indirectly, except through its regular dealers.

RUSSEL MOTOR AXLE CO., Detroit, has recently installed a bonus system which will net each employe who qualifies under the conditions of the plant an additional 10 per cent. of his month's wage. Payment of the bonuses is subject to the approval of the department foreman under whom the employe is working. Starting February 1, 1917, 10 per cent. of the month's wages of each employee who qualifies will be granted to him. The payment of these bonuses will be made every three months, starting August 1st.

FREE



To Drivers, Owners and Manufacturers

Send the coupon below for a copy of this remarkable new book. At last! The whole mystery of carburetion and carbureters has been reduced to simple A-B-C terms that any layman can readily understand. No other man in America has a better knowledge of carbureters and carburetion than Raymond M. Anderson. This well known carburetion engineer, in this wonderful new book, has given to the automobile trade the first simple, clear, practical explanation of the most vital element in motor truck operation—fuel consumption.

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A REMARKABLE BOOK

No matter how much you have studied or how many books and articles you have read on the subject of carbureters, their operation and adjustment, their perfections or imperfections, your education on this subject is not complete until you have read Mr. Anderson's book. Never was information on this subject so valuable as now when the price of gasoline is mounting higher and higher. Tear out and mail the coupon below. If your request is received before our supply is exhausted we will be glad to send you a copy of this amazing book absolutely free.

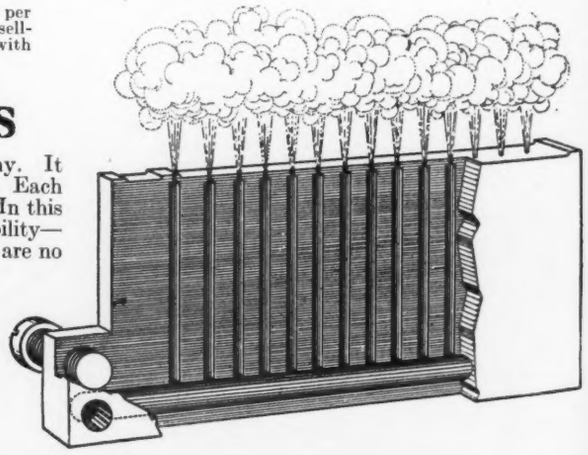
Drivers! Every driver knows that the carbureter is the seat and source of nine-tenths of all engine trouble. You do not know your car until you know your carbureter inside out. What to do and how to do it when it stalls or "eats its head off." Make your services worth more money to your employer by becoming absolutely master of your carbureter as you are master of your steering wheel. Avoid expensive, disastrous lay-ups on the road.

Owners! Give to this question of the carbureter and its fuel consumption a little of the study you give to tire mileage. This book will save you the price of a whole set of tires every few months.

Truck Builders! You can make "the cost per mile" the biggest, strongest selling feature of your truck with the aid of this new book.

Cut Your Fuel Bills

Note the illustration—it is the secret of gasoline economy. It shows the 14-jet fuel feed of the Master Carbureter. Each jet delivers a fine mist of thoroughly vaporized gas. In this way the fuel reaches the highest degree of combustibility—every particle is transformed into power. There are no "unexploded centers"—no waste. Contrast this advanced system of vaporization with the ordinary 1 to 3-jet stream-like spray. The difference means 25 to 40% more mileage—30% more power. Let us tell you more about the Master Carbureter—the carbureter with NO ADJUSTMENTS — the FINAL carbureter.



Master Carbureter Corporation
1206 W. Fort St.
Detroit, Mich.

You may send me, without obligation on my part, Mr. Anderson's article.

"Carburetion and Carbureters Explained" and description of the Master Carbureter.

Name.....

Address.....

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Pacific Coast Branch:
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1206 W. Fort St., Detroit, Mich.

TRAILER DEPARTMENT

A Trailer Selling Hint

Suggested Forms for Hand-Written Personal Letters to Prospects

By FRANK FARRINGTON

TRAILER dealers might, with advantage, spend a little time each day writing letters to those who could use trailers in their business. By this is not meant form letters, printed by the hundred and all just alike, whether sent to grocer, farmer, lumber dealer, coal man, feed man and everybody else who might possibly use a trailer. The form letter plan of advertising is good, and would produce some results probably, but still better is to write personal letters one at a time to a selected list, making each letter fit the individual to whom it is addressed. These will be form letters in a way, but they will have all the character and characteristics of individual letters.

To show what is meant and perhaps make it easier to do, in the following are offered some forms for these letters, with the expectation, of course, that they will be changed to fit the case in hand.

An hour a day spent in writing such letters might enable a dealer to reach from four to ten men every day, according to how rapid a writer he may be, and a personal letter to a man, calling his attention to a business proposition, will interest him and be read and given consideration as nothing else will.

A letter along the following lines can be made to fit the farmer prospects:

> Dear Sir—How much of a load of feed or produce can you carry in your automobile?
>
> Have you sometimes wished it was a truck? And haven't you often thought how convenient it would be if you had a truck and a family car too?
>
> Now perhaps you have thought of this way out of the diffculty and perhaps you haven't, but anyway it won't do any harm for me to suggest it to you.
>
> Get a trailer.
>
> A trailer doesn't cost a lot of money. The upkeep on it is so little as to be next to nothing. It makes a truck of your touring car, or whatever kind of car you have. It will even increase the carrying capacity of a truck without the danger that comes with overloading.
>
> With a trailer you have a means of going light when the road is bad by leaving the trailer at home, and traveling with a load when the road is good.
>
> A trailer with automobile springs and ball bearings is drawn with very little power, especially if you do your hauling over a macadam road. We can sell you a trailer with tires guaranteed for 7,000 miles, a carrying capacity of 1500 lb. for $125.
>
> Here is one convenience of a trailer. When you come to town for a load, leave the trailer where the load is to be put on and use your car around town. Couple on the trailer when you are ready to go home. Same when you bring a load. With a trailer you don't have to wait.
>
> Let me send you a description of a good trailer.
>
> Yours very truly,
> Fred Brown, Agent.

Perhaps this is a little long for a pen-written letter, but it can be cut as much as one likes, or have whatever it needs added. The thing to do is to get the farmer prospect thinking about the trailer proposition. Then when the dealer talks to him personally some day, he will be at least sufficiently interested to ask some questions—and when a prospect gets to asking questions he is at least started in the right direction.

Probably some of the dealers' prospects will be farmers who have neither automobile nor truck and buy neither because they cannot afford a car for pleasure use and they do not want to put so much money into a car that will be useful only as a truck. Perhaps the farmer is hesitating what to do and just lacks a little incentive to bring him in to talk business. In such an event he may be written to along this line:

> Dear Sir—If you could find a car that would be available for family use in the form of a nice-looking touring car with no commercial attachments, and still be available as a truck when you wanted it for that purpose, wouldn't it look good to you?
>
> Perhaps you have looked through the automobile advertising in search of a car that seemed to be suitable for combination use, only to find that everything that had any real value as a truck showed the truck features too much and was too uncomfortable to be satisfactory as a family car.
>
> We have what you want. The solution of the question is the TRAILER. We sell you the car you want and we sell you for a hundred dollars or so the attachment that **makes your car a truck** whenever you need it.
>
> You know what automobiles cost. You have your choice of those. The trailer to carry 1200 or 1500 lb. load, or whatever you see fit, costs from $100 up. You have been looking for a car that at an extra cost of $100 or more combined the features you wanted. If you had found it, would it, could it possibly come as near being **just** what you want as a car and trailer combination?
>
> Why don't you come in some day and see just what a good trailer looks like and what it will do for you?
>
> Yours very truly,
> Fred Brown, Agent.

There is one person who sometimes blocks the buying of a truck for the farm, and that person is the farmer's wife. She hears her husband talking truck and she knows that he is thinking only of the business end of the proposition. She has been thinking of the comfort that would go with a touring car. She knows that the farmers who have cars to get to town shop easier and oftener. She sees them go by to attend evening entertainments in town and to go to celebrations so far away that driving the horses there is not practical, even if they were not too tired after the day's work.

When the farmer talks truck, the farmer's wife comes back at him with talk about a family car and she tells him she is not in favor of buying an automobile to save the horses and the hired man until they have one to save her and the children and to give them more enjoyment. Of course the trailer is the answer. A letter to farmers' wives will sometimes clear the atmosphere and get the wife pulling for the dealer instead of against him, such as this:

> Dear Madam—You want to ride to town in an automobile because it takes less time and it rests you.
>
> With an automobile in the family the same pleasure the town people have is yours. Night or day, it is all the same. You can come to the moving pictures or you can come shopping and you can get more enjoyment out of life without taking away from the time needed for home duties.
>
> But the farm needs a truck. There's the hitch. The question is how to ad-

just the matter. The truck is a business proposition and it will help make more money and reduce the time of hauling. It will save the horses. You know all about those things because you have heard it talked over. The question is whether you are to sacrifice the business advantage or sacrifice the family pleasures.

You need not do either!

You can have a truck and a pleasure car without having to buy one of those nondescript near-autos that are neither truck nor touring car. And this is the way.

Buy a car and a trailer.

The car can be just what you want in a car. The trailer can be hitched on behind when you want to haul loads. It costs only a hundred dollars or so more to have a trailer and make your car a truck when you want a truck.

Let us show you and your husband what there is about this trailer business. We're here to give information whether you want to buy or not.

Cordially yours,
Fred Brown, Agent.

Then there is the grocer or the other merchant who has a family car or who wants one, or who has a nice delivery car not a truck. He is a good prospect for a trailer and the dealer might sit down and write to the best men on that list in about this manner:

Dear Sir—You have a nice delivery car and it looks good running around town, distributing your goods. Every car adds to the town's appearance of prosperity.

Did you ever think that it would be convenient to have a car just a little heavier and bigger so you could haul some bigger loads? You don't want to sacrifice the appearance of a neat delivery to the cumbersome appearance of a truck, to say nothing of the fact that a truck would be too slow and unwieldy and too expensive to operate.

There is a way in which you can make your delivery car do heavy work on occasion, without sacrificing any of its present advantages.

The Trailer. That's the answer.

A hundred dollars invested in a trailer that will last you for years with a nominal upkeep, will make it possible for you to haul your freight from the railway station with your delivery car and to draw out the big loads of goods that now you have to have hauled by someone else.

A trailer costs nothing when not in use. There is no depreciation to it when it stands in the garage. As a matter of fact there isn't much depreciation when you are using it.

It is all ready to hook on behind in a minute when you want it. Leave it at the freight depot as you go by and pick it up with its load on as you come back.

Trailers are fast coming into fashion. You can be one of the earlier users in our community if you get in line now.

Anyway I'm going to send you a folder about them in a few days.

Yours very truly,
Fred Brown, Agent.

The owner of a delivery car or a touring car is not the only prospect for a trailer. There are the men who own trucks. There is no reason why a trailer will not add to the value of a truck. Plenty of trucks have driving power for more than their maximum load. Here is a letter the trailer dealer might send to truck owners:

Dear Sir—There is a limit to the load your truck will carry.

Even if you can overload it and get away with it, it is poor operating economy to do that, even occasionally.

There is a guarantee on your truck if it is new, but you know, and the man who sold it to you knows that if you ruin your truck with overloading, you will have no claim on the maker.

Some truck agents tell their customers that, while the truck is a one-ton truck, it will easily carry a ton and a half. That is probably so, and it is a credit to the truck makers that their trucks stand up so well under constant overloading.

But that does not make it economical to overload. Overloading shortens the life of the truck. Don't make any mistake about it.

Why not use a trailer instead of overloading? Overloading a truck takes several hundred dollars out of its wearing, lasting power. The trailer costs only a paltry hundred or so all told.

It often happens that you have to handle bulky stuff that does not make up a load by weight when it is more than a load by size. A trailer will increase your carrying capacity perhaps half in such a case.

When your truck will not safely hold up more load than you have put on, you quite possibly have in it a motor that will pull on your good streets half as much more, or twice as much. Trailers will make it possible and **safe** to pull all the load your motor is good for.

Make less trips, use less tires and less operating expense of all sorts by using trailers.

Trailers cost little. Their depreciation is slight. You can leave them and pick them up as needed. They need no particular care. They often make the difference between operating trucks at a profit and operating them at a loss.

We have a car of trailers on the track now. They will be in our show room to-morrow.

Yours very truly,
Fred Brown, Agent.

There is a class of car owners, some of them women and some of them with women who do some of their driving. These people may be farmers or others. For the most part they are probably farmers and this year the matter of labor is so important on the farm that where hauling can be done by the women it is going to be helpful to let them do it. Such a letter as the following might be written to the dealer's farmer friends who have women drivers in their families:

Dear Sir—Farm labor is mighty scarce. Right now there is a demand in New York State for 50,000 hired men. Wouldn't you be glad to add to your force a hired man who would work for you for several years for a hundred dollars, without eating anything?

Here is a way you can practically do this.

You have a car in your family. That car is not suitable for hauling produce or feed or anything but people and small parcels. When you want to haul stuff, it takes a man and team or a truck, or you have to hire, which is the same thing.

By investing a hundred dollars or so in a trailer that will hitch on to your car, the women of the family can do the hauling at no inconvenience to themselves and with a great saving to you.

Load up the trailer and let your wife take it to town, where the receiver of the stuff will unload it.

Or send her to town to bring back a load of feed. She will be glad of the outing, for that is what it is, and you will get the hauling done for the price of a little oil and gas.

This actually means the saving of farm labor for your farm and a saving of wages.

Let us go into detail with you about this.

Yours very truly,
Fred Brown, Agent.

It is not impossible that the labor situation among the farmers may be so serious in some sections that the trailer-and-woman-driver proposition may be taken up in a public way as a help in solving the crop handling work. If any such condition threatens a good plan would be to get in touch with the chamber of commerce, or the farm bureau and talk to them about it. It may be that the dealer will be willing to make a patriotic matter of this and offer to supply trailers to a limited number of people without exacting the profit, or he may be able to sell several to the chamber of commerce to be loaned here and there wherever they can be used to best advantage. Such an organization can find cars and women drivers who will "do their bit" by helping in this way to relieve the shortage of labor among farmers who cannot afford trailers or who have no motor cars.

This is a time when men in all lines of business are making sacrifices, and some of the dealers who cannot go to war or send sons, can sacrifice profits and time to help in solving the food-shortage question. It may as well be admitted that the main thing this year is not making money, but helping the greater welfare of the country and of our military allies.

The dealer should use his personal stationery in writing his trailer letters and sign them with his own name—not "Jones' Garage," or "Brown's Implement House," but "George Jones" or "Fred Brown." The personal element will help. The wisest ones will suspect even these personal letters of being not really personal. Enough typographical mistakes should be made in them, or in the lining up of paragraphs to make it obvious that the letter is not a duplicated form.

Where the dealer knows the recipient well he can insert some friendly paragraphs, or get "under the reader's belt" in one way or another by making it a real, individual letter and by making it obvious that it is just that.

Farmers in particular will appreciate the personal attention given them in this way and it will make it easier for the trailer dealer to get into personal touch with them.

The Walter Four-Wheel Drive Tractor

THE LaTille Motor Association of Paris, France, designed the four-wheel drive and steer Walter tractor upon the request of the French War Department for a military tractor. The final O. K. for this design military tractor was passed in 1913. Their requirements were most severe for transportation of army equipment and supplies over any and all road and field conditions necessitating great traction power, extreme ruggedness in construction and reliability in operation.

It embodies the latest features of both American and European design with additional exclusive improvements. Although built for power haulage, as a medium between the motor truck for good roads and the tractor for muck, it also is designed to carry a 2-ton load and haul up to 8 tons on one or more trailers. The engine has four cylinders, cast in block, water cooled, 4⅜-in. bore by 6-in. stroke. The engine speed is 1200 r.p.m., 50 hp., developing a draw bar pull of 5000 lb. from either of the wheels or the cable and drum. It will turn in a circle of 25 ft., having a special worm differential, enabling each wheel to be driven independently and preventing the slipping of any wheel for lack of traction. Ignition is from the magneto only. Wheels are interchangeable. The speed control (by governor) limits it to a maximum of 14 m.p.h. It has four speeds forward and one reverse. The road clearance is 13 in.

The specifications include a carburetor, double jet, float feed type, with hot air intake, high tension magneto, steering wheel on left side, right hand control, engine controlled by both foot accelerator and hand throttle, spark control on dash, tubular radiator behind the engine and water circulating pump in the cooling system; clutch, cone type with easy engagement springs; transmission, selective sliding gear type; differential, special worm gear type, irreversible and requiring no differential lock, giving positive drive to all four wheels, final drive of universally jointed shafts from differentials to spur gears mounted on each wheel; brakes, foot and hand operating to all four wheels; steering gear, irreversible worm and gear, adjustable for wear, steering all four wheels; axles, high carbon forged steel, interchangeable front and rear, one-piece cast steel wheels with hollow spokes and rims, mounted on adjustable taper roller bearings; tires, dual 1000 x 100 M.M., solid rubber on all wheels; springs, chrome manganese steel, semi-elliptic type, 3 in. wide, banded at the center; winch, at rear end, driven by worm gear, equipped with 100 ft. of ⅝-in. cable; frame, extra heavy rolled channel steel, with cast steel cross members, front cross member acts as projecting bumper; cab, sheet steel over driver's seat, coil spring, leather upholstered cushions and leather upholstered back equipment; two oil side lamps and one oil tail lamp, two gas headlights, one gas generator, one horn, one tool box.

The wheelbase is 108 in.; tread, 64 in.; diameter or turning circle, 25 ft. measuring over the outside tracks; length of chassis, 16 ft. 11 in. over all; width 79 in. over all, and weight, 8000 lb. complete; price, $5000.

The Walter four wheel drive tractor is manufactured by the Milwaukee Locomotive Mfg. Co., Milwaukee, Wis., and the exclusive sales agency for the United States is controlled by the Mercury Mfg. Co., 4118 Halsted Street, Chicago, Ill.

HITCHON HANDY AUTO TRAILER

The Hitchon handy auto trailers produced by the Auto Kamp Equipment Co., Saginaw, Mich., are made in one capacity only, 1500 lb., this being a size well suited to the requirements for light delivery. All bodies are made of selected woods, properly seasoned and securely ironed. They are regularly painted in black finish, neatly striped. Special painting may be had at a small additional cost. Models B and F are provided with drop end gates on both front and rear. The under side of the floor in these models is covered with muslin faced buckram to prevent the dust from coming through. Three semi-elliptic springs are provided, two being located on the axle and one on the draw pole. Axles are 1⅜ x 1⅜ in. solid drop forged steel, plain bearings being provided on the solid tired equipment and amply provided with grease cups. With pneumatic tire equipments ball bearings are used exclusively. The pole is made of high quality steel, running through a bracket for supporting the front spring. This bracket is so made as to allow the forward and backward movement of the pole without allowing it to turn. The pole is attached to the axle by means of a bracket which allows for forward and backward movement. A heavy coil spring is located on the pole on both sides of the axle. This serves to take up both the forward and reverse shocks. Radius rods are provided for the further strengthening of the spring suspension and draw pole.

General Specifications

Axles—1⅜ x 1⅜ in. drop forged steel. one piece.

Springs—Three 1½-in. semi-elliptic, two on axle and one on draw pole.

Tires—Solid 34 x 1¼ in.

Track—Regular, 56 in. Special 60 in. will be supplied for southern trade at no additional cost.

Bodies—High quality woods, properly seasoned, securely ironed and braced.

One of the Auto Kamp Company's Trailers Attached to an Overland

Painting—Black, carriage finish, and neatly striped. Special painting and lettering at slight additional cost.

Capacity—1500 lb. additional load.

Weights—Approximately 425 lb. Shipping weights, 500 lb.

Speed—With solid tires up to 25 m.p.h. With pneumatic tires, up to speed of car.

Hitch—Proper hitch will be provided for any make of car. In ordering specify make and model.

Draw Pole—Best quality steel, adjustable ball end. Coil springs each side of axle.

Prices—F.o.b. Saginaw.

	Model B	Model F	Model P
Solid tires	$80	$85	$85
Pneumatic tires.	105	110	110

The Duplex Drawing Four Guns and Caissons

The United Six-Ton Tractor

A REVOLUTIONARY idea in hauling methods has been incorporated in a 6-ton tractor now being produced by the United Motors Co., at Grand Rapids, Mich. It embodies the principle that a much larger load can be pulled than carried and with greater ease. The features of transportation which the machine makes possible for every line of endeavor are numerous.

The feature of the new United tractor is the patented flexible spring suspension at the rear of the chassis. This construction not only relieves the chassis of pay load weight, but it gives the flexibility which is essential for moving great loads. The springs A, in the line cut illustration, which support the rocking trailer platform, carry 40 per cent. of the pay load weight on the solid or dead axle. The balance, or 60 per cent., is carried on the rear or trailer axle. This relieves the cantilever spring B of all pay load weight. The free ends of the springs A are slidably mounted in the chairs that are fastened to the solid or "dead axle," thus permitting free and unrestrained action under all conditions.

On the under side of the springs where the cantilevers are anchored to the frame, are brackets to which are fastened by substantial pins, the radius arms. These arms extend to the rear and are bolted to the under side of the trailer platform spring seats, which, in turn, are fastened to the solid or "dead" axle.

The trailer platform or rocking turntable, connecting with the tractor, is built of substantial angle iron heavily reinforced and covered with boiler plate on its upper surface. This construction permits the use of any diameter upper circle on the load carrier, no changes of the old circle being required.

The various trailers are interchangeable and the work of disconnecting can be done in a trice. For instance, if a contractor is hauling lumber from a yard to a construction job, he may employ three trailers and one tractor. When one is loaded and taken to the job it is left for unloading and the tractor returns for another trailer, which, in the meantime, has been loaded. Consequently there is no lost time. The men at both ends of the line are constantly busy and the entire equipment is always in use.

The United tractor sells for $3240 complete. This includes a trailer which represents about $750.

But one driver or one crew is required to operate the machine. Consequently there is a big saving on operating cost against a fleet of trucks capable of doing a like amount of work.

Specifications of the United Tractor

Engine—Buda long stroke, 4¼-in. bore by 5½-in. stroke. L-head type, cylinders cast in block. Interchangeable poppet valves. Three-bearing crankshaft, all bearings being attached to upper half of crankcase. Ample bearing surface for heavy duty work. All moving parts readily accessible. Constant level oiling system, splash and force feed by plunger pump. Oil supply five quarts capacity. Cooling by means of centrifugal pump and fan.

Transmission—Four speeds forward and one reverse, selective type. Nickel steel gears and spline shaft; heat treated and ground. Ball bearings throughout.

Steering Gear—Worm and block type with large bearing surfaces accurately ground. Bearings easily adjusted.

Radiator—Cellular type; ample capacity for heavy duty work. Shock proof, flexible mounting.

Front Axle—Drop forged, I-beam, heat treated, extra large bearings and spindles.

Rear Axle—Torbensen internal gear. Gear ratio 9 to 1. Load carried on dead axle. I-beam cross section. All gears nickel steel and heat treated.

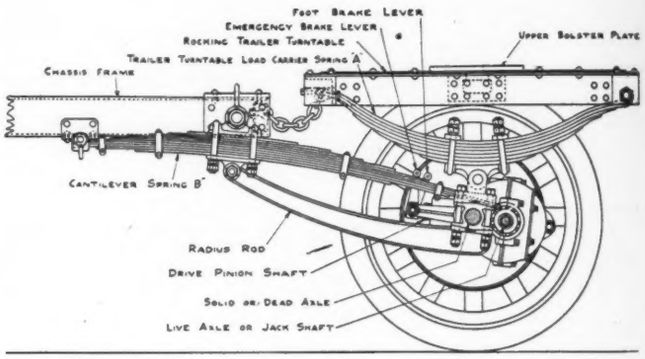
Propeller Shaft—Carbon steel seamless tube. Two universal joints operated at minimum angle. Dust and grease tight. Easily lubricated.

Seat and Dash—Steel, spot welded and strongly reinforced. Deep cushion and comfortable back pad.

Springs—Front, semi-elliptic, 2¼ x 38 in.; silico-manganese special design. Rear, cantilever, 2 x 52 in. special design. Load carrying springs, semi-elliptic, 3 x 41 in.

Magneto—Bosch DU-4. High tension, water and oil proof.

Gas Tank—28 gallons. Steel, electric welded.



The Flexible Spring Suspension at the Rear of the United Tractor Chassis

Wheels—Front, wood; heavy artillery type; rear, cast steel, spoke type.

Tires—Solid rubber. Front, 34 x 3½ in.; rear, 34 x 7 in.

Carburetor—1¼ in. Equipped with hot air tube from exhaust pipe.

Clutch—Multiple disc, Raybestos faced; 17 discs of saw blade steel.

Wheelbase—110 in.

United Motors Six-Ton Tractor Hauling a Load of Six and a Half Tons of Flour
This one load was larger by three times than any load the Voigt Milling Company, Grand Rapids, Mich., ever before dispatched

WICHITA FALLS MOTOR CO., Wichita Falls, Tex., has received an order from the Russian Government for 400 trucks, to be delivered within the present year.

VIM MOTOR TRUCK CO., Philadelphia, has granted an increase of 10 per cent. in the wages of all its employes. A reduction of 2½ hours per week in the factory's actual working time was also made. But this in no way affects the increase in wages, as the men will be paid their former weekly wages for the shorter hours and the 10 per cent. additional increase.

GARFORD MOTOR TRUCK CO., Lima, O., has secured an order from the New York City Department of Street Cleaning for thirty-four Garford tractors amounting to nearly $200,000. After hauling trailers used in the removal of ashes, street refuse and garbage during the day, the truck will furnish the power at night for hauling and operating the street sweepers and street flushing apparatus.

WEIGHT OF LONDON MOTOR 'BUSES TO BE REDUCED

By L. M. MEYRICK-JONES

The evolution of the motor omnibus in London has done so much for the development of heavy motor transport as a whole, that a memorandum, just issued by the Commissioner of Police, deserves particular attention.

Ever since the heavy commercial car first appeared the British law has restricted it to a maximum weight of 5 tons (about 5½ short tons American), unladen. In its early days the motor omnibus was merely restricted to that weight under the law of the land, but experience showed that the very heavy vehicles thus encouraged were not only heavy in repairs on themselves, but extremely damaging to the roads, and in some cases even to the foundations of houses. Accordingly, under the powers that he has in the metropolitan area, the London Commissioner of Police in 1909 brought out a new regulation that motor omnibuses, if they were to be licensed, to ply for hire on the London streets, would have to weigh not more than 3½ tons (British 2240 lb. to the ton), for the complete vehicle unladen, or 6 tons fully laden with thirty-four passengers, driver and conductor.

At the time of its introduction this regulation was met with strong opposition by the British automobile trade, who maintained that it would be impossible to produce a satisfactory and durable motor omnibus within these limits. Nevertheless the police authorities were right, and the result was first the X type chassis, then the more famous B type, which has contributed more than anything else toward the present day success of the motor omnibus and in no small degree to that of the motor truck as a whole. Remembering this, it may be assumed that the present memorandum would not have been issued by the police without some fairly solid reason of practical fulfilment.

The proposals in the memorandum are of far reaching importance. The Commissioner states definitely that the experience of the last six years has led him to the conclusion that it is now possible to construct vehicles suitable for London requirements on a lower unladen gross weight limit that at present, but it is somewhat difficult to see what the Commissioner is driving at, when he goes on to say "it is well known to manufacturers that since 1909 methods of production of gearing have been developed, which will make it practicable to obtain silent and efficient working with lessened total weight on transmission mechanism, and some reduction may be expected in the total weight of power and of transmission mechanism throughout." No doubt, however, he has some reason for this.

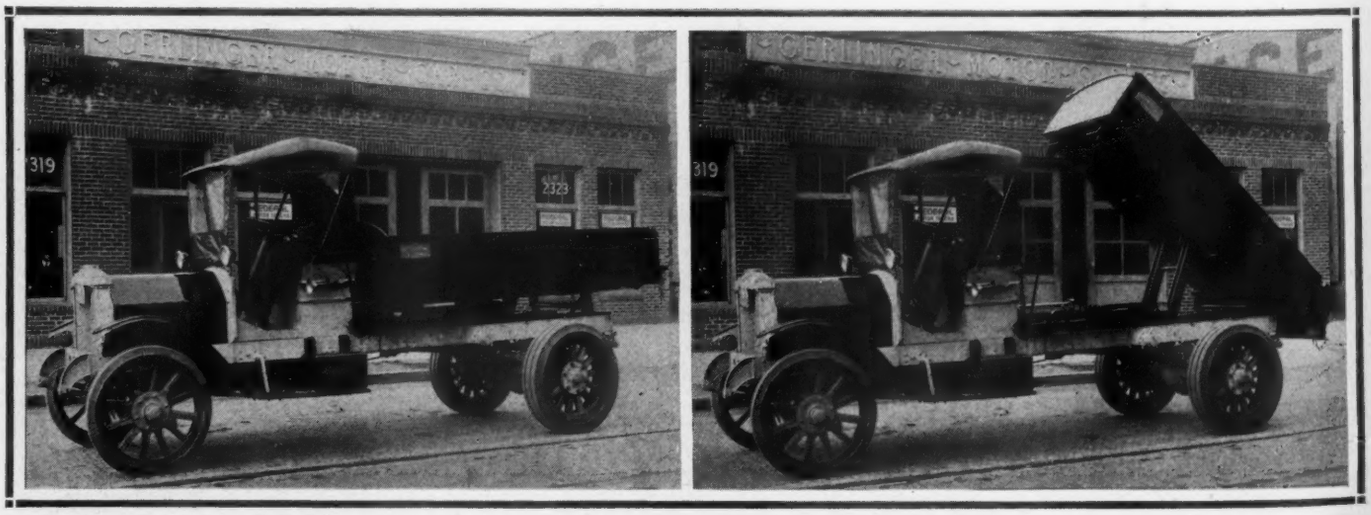
The writer has reason to believe that after the war we may see material improvements in engine efficiency, but it is not easy to realize how the transmission can be greatly lightened, seeing that on the top gear, generally employed, the power is transmitted by direct drive from the clutch to the back axle. Nor is it easy to see how the weight of the present double decked 34-passenger body can be very materially reduced, if it is to stand up to its work. It may be that a reduction in seating accommodation is contemplated by the Commissioner, who, however, gives no indication of any such intention in his memorandum; in fact, the implication is rather in the other direction, since he gives "timely notice that new vehicles presented for licensing must be of a type differentiated from existing types by being lighter in weight, and with a better form of power transmission."

It must be admitted that even on the 3½-ton weight limit the wear on roads is still very considerable, resulting in bad pot holes, or a peculiarly corrugated surface, which makes very rough, lumpy riding for all automobile vehicles, and this road wear is an evil which rapidly grows on itself. Generally speaking, the corrugated surface appears on macadamized roads subjected to regular services of motor omnibuses, while other roads carrying the same sort of traffic generally tend to pot holes. Whether these evils are caused mostly by weight, frequency of service or speed, is a question on which at present no really reliable data exist, more particularly so since the policy of tarring the roads has materially affected the question, for since that policy was first adopted there has scarcely been time to compile such data. In the writer's opinion there is little doubt that the speed factor has a good deal to do with this matter and that less road wear would occur, if the legal speed of 12 miles an hour was observed always and everywhere, for on most lengths of road too often speeds far in excess of this are usual.

No immediate change, however, is contemplated, the pronouncement of the Commissioner being rather in the nature of an invitation to manufacturers to co-operate with the authorities in the production of a lighter type of omnibus.

REDDEN TRUCK CO., Chicago, Ill., capitalized at $4,000,000, is planning to establish twenty assembling plants in twenty of the largest states of the country. The main factory will be located at Joliet, Ill., Jackson, Mich., or Chicago, Ill. Subsidiary plants will be established and operated after the plan of the Ford Co. The Redden Co. makes a truck unit device patented by Albert E. Cook.

HYDRAULIC PRESSED STEEL CO., Cleveland, Ohio, has confirmed its recent purchase of the Cleveland Welding & Mfg. Co. The company has increased its capitalization from $2,500,000 to $5,500,000, all common, and declared a 125 per cent. stock dividend to stockholders, thereby distributing the new stock. At present the Cleveland Welding property will be conducted as a separate plant. A. W. Ellenberger, who was president of the Hydraulic Co., has been elected as chairman of the board. James H. Foster, formerly vice-president and general manager, has become president, and H. P. McIntosh, vice-president; Ben P. Bole, secretary, and R. D. Mock, formerly assistant secretary and assistant treasurer, is now treasurer, and will retain the duties of assistant to the secretary. H. B. Bole, formerly factory manager, is now general manager, and he is succeeded by George C. Brainard. O. P. Stehn is sales manager, and J. E. Malony, sales manager for the pressed steel department.



Two and a Half Ton Gersix Truck With Special Body

Two views of two and a half ton Gersix truck with special body in normal and dumping positions. Purchased by the county commissioners for road work in Cowlitz County, Washington. Four-inch front and ten-inch rear Firestone tires

THE PUBLISHERS' PERSONAL PAGE

"A good example is the best sermon"

No Time to Reduce Advertising

ALBEIT we may seem to be prompted by selfish motives, we would join with the others who are urging the business interests to keep up their advertising. This follows out what we said last month about Pessimism being Treason and Optimism being Patriotism; for it shows a lack of optimism regarding the business outlook when any organization reduces its advertising.

It is not our purpose, however, to plead for patronage for ourselves any more than for all publishers generally, and we do truly feel that it is most of all in the interest of the business world at large, at just this critical period, to advertise not less but, if anything, more than ever.

What Others Have to Say

It will be seen that there are many others competent to speak, representing both publishers and advertisers, who are preaching the same doctrine. Read, for example, on page 19 of this issue the editorial taken from the July "Firestone," the house organ of the Firestone Tire & Rubber Company, on the subject, "Advertising and the War."

If business is going to continue good there is no occasion to reduce advertising, and on this point again we would prefer that the testimony of a business house be taken. Following is a letter written to the garage trade by the Curtis Pneumatic Machinery Company, St. Louis:

> There is a tendency in some parts of the country to be overcautious on account of the war conditions—"hysterical economy," some people call it. Your business has to exist during the war just the same as it does any other time. So we may as well sit down calmly and face the true facts. What you want to know is whether your customers are going to stop buying abruptly, or gradually slacken, or what.
>
> There's one thing you can't get away from. As long as the people have more money than they ever had before, they are not going to stop buying, or limit their buying. The money of the world is in the United States today, in the hands of the people, and when they have the money they are going to buy. Of course, prices are going to be higher, but, at the same time, wages are higher. With more money, the scale of living is better. More people are prospective customers today, especially in the automobile business, than ever before in the history of the trade.
>
> There does not seem to be a chance at all for prices to come down before the end of the war; even after the war is over, the readjusted scale of prices will be decidedly higher than were normal prices before the war. During the war, labor will be scarcer; wages will be higher. The scale of wages will not be reduced until we run into hard times again, and even then we have doubt as to wages ever equaling the lower wages prior to the war.
>
> Every farsighted business man should, therefore, look ahead and protect himself. Don't stop buying now, because prices may go higher yet, and very likely will. Don't retrench, but adjust your business for what is only a readjustment of conditions. Business in the immediate future is not going to get worse; it is going to get better.
>
> This letter is written to help you analyze the situation as it exists today. It expresses our own analysis and the one upon which we have based our purchases for the future. Our advice is to buy now, and that is the message which we have in this letter for you.
>
> We hope that this review of conditions will be of service to you. We believe it will, if you take advantage of it.

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Speaking from our side, the "Chicago Evening American" in the section called "The Buying American," has every few days some potent facts to encourage the effective use of advertising, and in these editorials has given some convincing figures to indicate that war helps, rather than hurts, business. The following facts were taken from this paper of May 11th:

> Our good neighbor, friend and customer, Canada, has more than doubled her foreign trade since the war began. In 1914 her total foreign commerce amounted to $909,634,821; in 1916, it had grown to $1,879,171,893.
>
> The average Canadian now has to his credit in the bank the sum of $92.25. Before the war he had only $55. This makes him the world's richest man. There is almost twice as much money per capita in Canada today as there was before the war.
>
> Every day, Canada is buying over a million and a half dollars' worth of goods from the United States.
>
> Today the sum of $1,270,000,000 is on deposit in Canadian banks. Eight million Canadians added over one hundred millions to their bank deposits in 1915, while heroically bearing their part in the World War. Canadians have subscribed to two hundred millions in war loans and extended credit to Great Britain to the amount of 250 millions.
>
> The bank clearings of Canada for 1916 were ten and a half billions, representing tremendous activity on the part of her people.
>
> In London the same condition prevails. Selfridge's, one of the largest stores, is a representative barometer. Statement of profits from the founding of the business in 1910 shows an increase every year, even in the face of war.
>
> For the year ending January 31, 1914, profits were £131,546
> For the year ending January 31, 1915, profits were £134,791.
> For the year ending January 31, 1916, profits were £150,222.
> For the year ending January 31, 1917, profits were £225,137.

Take This Advice to Heart

We would urge that individuals and companies think, preach and act optimism; not only for their own profit, but as a patriotic duty. If you preach confidence in continued good business, do not let your actions belie your words by any diminution of the amount of your advertising.